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THE IRON TRADE REVIEW

A Weekly Journal Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

VOLUME XXXVII CLEVELAND, OHIO, SEPTEMBER 8, 1904 NUMBER 36

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THE IRON TRADE REVIEW

VOLUME XXXVII CLEVELAND, OHIO, SEPTEMBER 8, 1904 NUMBER 36

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The uncertainty that for weeks has been an embargo on business in finished steel has been broken by the action of the beam and plate pools on Tuesday. On plates above 24 inches in width the reduction is $4 a ton or to 1.40c Pittsburg, and on narrow plates $6 a ton. Beams and channels are reduced to 1.40c Pittsburg, or the lowest price that has prevailed in four years. It is understood that arrangements have been made that will prevent the cutting of prices on fitted material that has been much complained of by certain members of the beam pool in connection with contracts taken in the past few months. The co-operation of the Lackawanna Steel Co. is understood to have been secured, at least to the extent of maintaining pool prices. How consumers will regard the new prices is yet to be shown. It is known that there were advocates of deeper cuts among the manufacturers themselves, but a consideration that appears to have had weight was the fact that the quiet time of the year for structural work is approaching, and it was argued that a pronounced revival in demand was not to be expected in any event before next year. At the same time it was pointed out that the present scale of operation at mills and the business in sight after so long a period of limited consumption did not indicate a necessity for drastic action. It is well known that consumers in some lines, particularly in shipbuilding, feel that a considerably lower price than $28 for plates is necessary to bring new work into their yards. Some action to meet this situation may come later, but the steel manufacturers have not seen fit to act as yet.

Expectation of a reduction on steel billets and on steel bars is general, but at this writing the agreed prices in these lines remain unchanged. Under the circumstances buying in both is light and will continue so. The feeling is general on the part of manufacturers that the general using up of stocks and the strong financial and agricultural situations, pointing to a resumption of industrial activity in the near future, suggest the avoidance of a radical price policy at this time. What may develop when spring is reached is another question.

There is little in general conditions to suggest a flood of demand following the New York meetings. Important railroad buying is not in sight. A considerable railroad draft upon the money supply may be expected before the railroads again contribute largely to iron trade prosperity.

Another reduction of the week was in wrought pipe, the leading interest taking the initiative and the cuts running from $1 to $4 a ton. Competition has increased in this line, some of it fortified in steel and pig iron. Under the readjustment mills buying their own skelp have a very narrow margin to work on.

Important business of the week can be readily summarized. Rail buying amounted with the leading producer to 20,000 tons of standard sections, half of which is for a new line in the far West. Pittsburg notes a 2,000-ton plate order for vessel work and a 3,000-ton inquiry for shapes for a New York elevator. The American Bridge Co.'s new business in August was between 40,000 and 50,000 tons, a considerable improvement upon July.

Foundry pig iron is quieter and somewhat weaker. Southern production has decreased because of the coal strike, and the end of the latter may be long deferred. There is rather more $9.25 Southern iron, but Northern furnaces continue to take most of the business. The starting up of Steel Corporation stacks continues, and the week brings the total to 15 additions to the active list in about a fortnight. Foundry operations do not show any distinct improvement on the whole, but in some centers more men are reported at work in machine shops.

PITTSBURG.

(Special Telegram.)

PITTSBURG, Pa., Sept. 7.—Meetings of the leading steel interests continue today at New York. It is doubtful if anything will be done on billets and bars today, although reductions are expected before the end of the week. The increase in the active blast furnace operations of the Carnegie Steel Co. is causing some surprise in the trade inasmuch as the demand for increased tonnage of iron must come from increased orders for rails and structural shapes, owing to recent heavy orders. The tin plate trade is exceptionally dull, not more than 50 percent of the tin plate mills of the American Sheet & Tin Plate Co. being in operation. On sheets the demand is better, about 75 percent of the mills being in operation. The plate market is unusually quiet, and practically no new business is being taken for foreign shipment owing to competition of German mills.

The American Steel & Wire Co.'s mills are expected to be all in operation within two weeks. The Edith furnace, Allegheny, and the Neville Island stacks continue idle and will probably remain so for some time owing to complaints of residents in the vicinity on account of ore dust and threatened suits. Iron which would have been made at these stacks will be furnished from Carnegie Steel Co. furnaces.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Sept. 6.

Reductions of $4 a ton on structural shapes and plates over 24 inches wide, and of $6 a ton on plates from 6¼ inches up to 24 inches were announced yesterday. These are the outcome of a series of conferences held in New York during the past three weeks among representatives of the leading steel interests, the constant shading of agreed prices on not only plates and structural shapes, but billets and bars as well having brought about these meetings. Nothing has yet been done on billets and bars, but reductions are expected to follow. On Monday a conference of several committees having these matters in charge was held in New York, and yesterday a general meeting of all parties interested was held, with the above result. If the plans of the officials of the steel corporation had prevailed a still deeper cut would have been made, the corporation's position with reference to lowering prices having changed completely within less than a month. An agreement on the cost of fitting material, applying to structural mills operating their own structural fitting department is also being perfected, and will no doubt obviate the many charges that have been made in the past of these mills reducing the prices of steel in order to keep their fitting departments operating full. It is also announced that the

Lackawanna Steel Co. is now affiliated with both associations and has agreed to maintain the new prices.

Owing to the large number of small independent steel companies operating universal and groove mills on which plates of narrow widths can be rolled, and fearing that they would immediately make concessions from the agreed prices if the reduction of $4 had applied to all sizes, it was decided to reduce plates up to 24 inches in width $6 a ton. With the present price of steel it will be impossible to shade this price, and even if billets are reduced $4 a ton, the amount of shading that can be done cannot greatly affect the market. The fixing of 1.30c as the price on sizes up to 24 inches practically establishes an official price on grooved skelp. With the plate market on this basis it will be impossible to continue the steel bar market on its present basis of 1.35c, and a reduction of $2 a ton is looked for.

Another reduction on merchant pipe has also been announced ranging from one to three points, the reduction going into effect on Sept. 3. Boiler tubing remains unchanged, however. Within the past six weeks reductions have been made on tin plates, sheets, wire products, merchant pipe, plates and structural shapes, and with the reduction in billets and steel bars the present readjustment of the market will have been completed. It is generally believed that buying will follow these reductions and that the market will be stimulated, though no great change is looked for until next year. The spread between pig iron and nearly all of the finished products is now at about the proper point.

That the demand and the outlook for finished material has improved in the past few weeks is indicated by the resumption of Steel Corporation furnaces. This week three additional stacks resumed operation, two of the furnaces being entirely new and never having been operated before. The blowing in of these stacks makes a total of 15 Steel Corporation furnaces in Ohio and Pennsylvania that have resumed operations or put into blast within the past two weeks. This week No. 1 at Mingo Junction was blown in, after being relined, while No. 4 at the Ohio works, Youngstown, and No. 2 at South Sharon, both new stacks, and which have been idle ever since they were completed, were started. Out of a total of 51 furnaces operated by the Carnegie Steel Co., 40 are in operation at present. Out of the total of eleven idle stacks, four are new and have never been operated, including two at Donora, one at South Sharon and one at Clairton. One at Edgar Thomson and one at Isabella are undergoing repairs, while one at New Castle is being entirely rebuilt. The other idle stacks, including those at Columbus and Zanesville, owing to their location cannot be operated profitably except in extremely active business periods.

The Republic Iron & Steel Co. this week shut down all of its plants at Youngstown, O., this action having been taken owing to the refusal of the Amalgamated Association to grant anything like fair terms on the bar iron scale for the ensuing year. Since July 1 this company has been operating a part of its mills, paying the Amalgamated 1903-4 scale, but the trend of events indicates that there is little possibility of an agreement now, and the further operations of its mills on this basis would mean a loss. On the other hand, if an agreement is reached on a lower basis than last year, the scale will date from July 1, and reductions will be made from the wages of the Amalgamated workers accordingly. The strike at the mills of the American Steel Hoop department of the Carnegie Steel Co. at Youngstown and Girard continues, the mills, however, having already been practically lost to the association.

Pig Iron.—The iron market continues quiet, and is somewhat weaker. Buying is limited to small lots almost entirely, the inquiry of the Westinghouse Electric & Mfg. Co. for 4,000 tons of foundry iron, for delivery to its Allegheny and Cleveland plants up to next April, being the largest that has been in the market for some time. On Bessemer iron it is possible to do as low as $11.75, although none of the furnaces in the Bessemer pig iron association will do better than $11.90. On Northern foundry $11.75 to $12 at the furnace is the spread, while forge continues to be held on the basis of $11.85 to $12, Pittsburg. Southern iron can be had on the basis of $9.25, Birmingham for No. 2 Foundry, but it is doubtful whether this can be shaded owing to the large number of furnaces out due to the coal strike. We revise quotations as follows:

Bessemer, Valley	$11 75 to 11 90
Bessemer, Pittsburg	12 60 to 12 75
No. 1 Foundry	13 00 to 13 25
No. 2 Foundry	12 60 to 12 85
Gray forge, Pittsburg	11 85 to 12 00
Chilled basic, Valley	11 65 to 11 75
Chilled basic, Pittsburg	12 50 to 12 60

Steel.—No reductions have yet been made in billets or sheet bars, although lower prices must be named owing to the reductions already announced in finished materials. Agreed prices are as follows: Bessemer and open-hearth billets, 4 x 4 inches, and slabs up to and including 0.25 carbon, $23 Pittsburg, Wheeling, Valley, Johnstown, Ashland, Ky., Irontown, O., and Lorain, O.; 0.26 and including 0.60 carbon $1 advance; and 0.61 to 1.00 carbon, $2 advance. Billets smaller than 3⅞ inches and sheets and tin bars are $1 per ton extra. Bessemer and open-hearth rods are quoted at $25.50 to $27.

Ferro-Manganese.—Domestic ferro, 80 percent, is held at $41 per ton, delivered in carload lots at buyer's mill, at any point east of the Mississippi.

Skelp.—Demand for skelp has improved somewhat, but low prices continue to be named. Sheared steel is held at 1.35c, and grooved at 1.25c to 1.30c. Sheared iron is held at 1.45c and grooved at 1.40c.

Muck Bar.—There is little demand for muck iron, and it continues to be held nominally at $24.50 to $24.85, Pittsburg.

Rails and Track Material.—No meeting to fix the price of standard section rails for delivery in 1905 has yet been held, although it is probable that this price will be agreed upon within the next three or four weeks. Low prices continue to be made on light rails, although there is little buying. We make the following quotations: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 to 40 pounds, $18 to $20. Track material, spikes, 1.55c to 1.60c.

Bars.—Demand for both iron and steel bars continues light, and there will be no improvement in the steel bar situation until definite action is taken with regard to prices. We quote as follows: Bar iron, 1.25c to 1.30c Pittsburg for local delivery, while for Western shipments quotations are based on 1.25c to 1.35c Pittsburg. Hoops are held at 1.55c base, and bands at 1.35 taking bar extras. Bessemer steel bars, 1.25c; open hearth, 1.40c; plow beams and cultivator beams, 1.35c net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.45c. The following differentials are maintained on steel: Less than 2,000 pounds of a size, not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance.

Pipes and Tubes.—A revised list on merchant pipe was issued by the leading interest on Sept. 3, carrying reductions from one to three points. The merchant pipe market is now on a basis of absolutely no profit to a mill not producing its own supply of skelp, and unless a reduction in both iron and steel skelp is soon made many independents will be unable to compete. Competition on merchant pipe has been very keen throughout the year, largely due to the increased number of small mills erected in the past three years. New business in both merchant and line pipe continues light, although it is believed that the late reduction will stimulate trade. Revised discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	71	55	60	53
⅜ and ½ inch	75	63	73	61
¾ to 6 inches	79	69	77½	67½
7 to 12 inches	74	59	72½	57
Extra Strong Plain Ends.				
⅛ to ⅜ inch	64	52	62	50
½ to 4 inches	71	59	69	57
4½ to 8 inches	67	55	65	53
Double extra strong plain ends, ½ to 8 inches	60	49	58	47

MERCHANT BOILER TUBES, LESS CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inch	48	43
1¾ to 2¼ inches	60	43
2½ inches	62	48
2¾ to 5 inches	68	55
6 to 13 inches	60	43

Plates.—A reduction on plates 24 inches and over of $4 a ton, and $6 on plates from 6¼ inches up to 24 inches was announced yesterday. While corporation interests favored a reduction of $5 a ton, the leading outside mills forced a more conservative reduction as announced. Considerable buying on the part of lake shipbuilding interests is expected to follow this reduction, a considerable tonnage having been held back owing to the high prices which have been prevailing. The $6 reduction on the narrower sizes was made to prevent concessions on the part of small independent mills not affiliated with the association, and who in the past have greatly disturbed the market. The Cambria Steel Co. this week received an order for 2,000 tons of plates from a lake shipbuilding interest and other orders are expected to follow. The price of 1.60c on tank plate has been held since April, 1901, and has been maintained with no great difficulty until a few months ago. Despite the fact that high prices prevailed on all finished products during the boom years, the association did not advance its official price, and it was believed until a month ago that no change in prices would be necessary. The present prices of 1.30c and 1.40c are not low, as during the months of July, August and September, 1900, plates were selling at 1c Pittsburg, and in a few instances this price was shaded. In November of 1900 an agreement of the plate manufacturers was announced, and the first prices were on a basis of 1.35c. In December an advance was made to 1.40c, and in March, 1901, an advance was made to 1.50c. The following month another advance was made to 1.60c, where the prices remained unchanged until the present cut. We revise quotations as follows: Tank plate, ¼ inch thick, 6¼ to 24 inches, 1.30c f. o. b. mill, Pittsburg; 24 inches up to 100 inches, 1.40c; flange and boiler steel, 1.50c; marine, A. B. M. A., and ordinary fire box, 1.60c; still bottom, 1.70c; locomotive fire box, not less than 1.90c and up to 2.80c; plates over 100 inches and up to 110 inches in width, not less than 5c per 100 lb. extra; plates over 110 inches to 115 inches wide not less than 10c extra; plates over 120 inches to 125 inches wide, not less than 25c extra; plates over 125 inches to 130 inches, not less than 50c extra; plates over 130 inches wide, not less than $1 extra; plates 3-16 inch thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except the Pacific Coast.

Sheets.—Demand for sheets is improving slightly, but there are constant reports of 2c on desirable specifications. We quote: No. 8, 1.60c; No. 9, 1.56c; Nos. 12 to 14, 1.70c; Nos. 15-17, 1.75c to 1.80c; Nos. 18-21, .85c to 1.90c; Nos. 22-24, 1.95c; Nos. 25-26, 2c; No. 27, 2.05c; No. 28, 2.10c to 2.15c; No. 29, 2.35c to 2.40c; No. 30, 2.50c to 2.55c. Galvanized: Nos. 12-17, 2.20c to 2.25c; Nos. 18-21, 2.35c to 2.40c; Nos. 22-24, 2.50c to 2.55c; Nos. 25-26, 2.65c to 2.70c; No. 27, 2.90c; No. 28, 3.10c; No. 29, 3.45c to 3.50c; No. 30, 3.85c to 3.90c.

Structural Material.—The reduction of $4 a ton on structural shapes announced yesterday it is believed will stimulate buying which has been held back. Considerable work is now being figured on by the mills and the indications are that much will be closed in the near future. One of the largest jobs on which specifications are out provides for 3,000 tons for an elevator in New York. The reduction to 1.40c on structural shapes is by no means the low point on this material, as during July, 1897, as low as 1c, Pittsburg was reached. The trend of prices was then gradually upward until 2.25c was reached in 1899. A drop in prices followed in 1900 until a reduction to 1.50c was announced by the association in August of that year. In March, 1901, quotations were advanced to 1.60c, and were maintained firmly on this basis until the cut yesterday. We revise quotations as follows: Beams and channels, up to 15 inches, 1.40c; over 15 inches, 1.50c; angles, 3x2 up to 6x6, 1.40c; zees, 1.40c; tees, 1.40c; angles, from 3 to 16 inches, 1.40c; universal mill plates, 1.30c.

Wire and Wire Nails.—Next week the idle wire and nail mills of the American Steel & Wire Co., at South Sharon, will resume operations in full. Practically all of the accumulated stocks of this company have already been moved and owing to reduced prices, a much heavier buying movement than would otherwise have been possible is looked for during this month and October. We quote as follows: Wire nails, jobbers' carload lots, $1.60; retailers' carloads, $1.65, and less than carloads, $1.75; painted barb wire, $1.75 to jobbers in carloads; retailers' carloads, $1.80, and less than carloads, $1.90, with 30 cents for galvanizing. Annealed smooth fence wire is held at $1.45, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron and steel cut nails are held at $1.65 to $1.70.

Merchant Steel.—Demand continued to improve, but as yet quotations are unchanged. We make the following quotations: Toe calk, 1.90c; carriage spring steel, 1.75c; tire steel, 1.55c to 1.60c; plow steel, 6 inches and under, 1.35c for Bessemer and open hearth; plow slabs, ¼ inch and heavier, 1.60c. Drawn and cold rolled shafting is held at 52 percent off in carload lots and 47 off in less than carload lots.

Old Material.—Demand for heavy melting stock is improving, but mills and dealers having large tonnages on their hands refuse to sell below $12.25 to $12.50, and a few are holding out for $13. With the resumption of idle plants an increased tonnage of melting stock is required and the increased demand is already being felt. We revise quotations, gross tons, as follows: Heavy melting stock, $12.25 to $12.50; re-rolling rails, $12 to $12.50; remelting rails, $11.50 to $12; low phosphorus melting stock, $15 to $15.50; sheet scrap, $9 to $9.50; No. 1 wrought, $12 to $12.50; cast iron borings, $6 to $6.50; No. 1 cast, $10 to $10.50.

Coke.—The resumption of fifteen idle stacks of the Steel Corporation in the past two weeks has resulted in a great increase in the active capacity of the H. C. Frick Coke Co. in the Connellsville region. This company now has about 80 percent of its ovens in operation, as compared with only 40 percent about two months ago. The demand for foundry coke is not increasing, however, while few new contracts are being made for furnace coke by independent interests. Strictly Connellsville furnace coke is again being offered on the basis of $1.35 to $1.40, and a few independent operators are again blowing out their ovens, rather than meet these prices. On foundry coke $1.85 to $2 represent the market. During the week ending August 27, the production of the upper Connellsville region amounted to 163,698 tons and that of the lower region 55,770. The production of the week ending Sept. 4, will show an increase over the previous week of about 25,000 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Sept. 7.

Much interest is exhibited by Western consumers in the pool meetings postponed until today. Many manufacturers, particularly those in the agricultural implement trade, went ahead and made contracts for this season's machines on the basis of prices recently prevailing and a change now would not only disturb those arrangements, but the confusion might lead to loss of trade. On the other hand, there are interests that have been withholding their specifications and orders for some time in anticipation of lower prices being announced, and the readjustment at the present time is expected to set in motion a buying movement of no small proportions. The loss of trade resulting from frequent telegraphed reports of pool dissolutions or at least a complete revision in steel prices, has been serious to producers of heavy finished material, and in the past week was very marked. Manufacturers are using up every pound of stock on hand before making new purchases, and their policy is to buy only for one or two weeks' requirements at a time. The country is practically denuded of stock, and a definite announcement as to the course of prices

for the balance of the year is likely to bring a large tonnage to mill books.

The Republic Iron & Steel Co. has shut down all its plants at Youngstown, O., for this week, and pressing orders will be filled from stock. No settlement has yet been made with the Amalgamated Association by this company, although the reason given out for the complete shut-down is lack of orders growing out of the unrest regarding prices and the fact that Monday being a general holiday, it was thought better to suspend operations for the balance of the week. Bar iron is strong at 1.35c Chicago, and no change in price is expected. Specifications for steel bars are fair, the tonnage not being equal to that of recent weeks.

The leading pipe interest has readjusted its prices on both steel and iron pipe, the reduction ranging from 2½ percent to 7½ percent. Nails and fencing are in active demand, producers having been swamped with orders for immediate shipment since the change in prices was made. Sheets are weak and the schedule based on $2.10 Pittsburg for No. 28 gauge black is being shaded from 50 cents to $1 a ton. Plates and steel bars have been offered at considerably less than pool prices, while official quotations on billets can be shaded at least $2 a ton in this market. Scrap iron is holding up well and several grades have advanced in the past week.

Pig Iron.—Transactions in the past week have been of a limited nature. The tonnage, while of good proportions, is made up of small lots, 100 tons and carload orders predominating. The market is strong, however, furnaces in the Birmingham district maintaining the $9.50 schedule without exception. Some interests, whose stacks are located outside this district, having a differential of 25 cents a ton in freight rate, are still offering No. 2 foundry on the basis of $9.25, and sales are frequently made at this price. The Northern market is also strengthening in tone. The local interest which has been quoting $13.25 Chicago for No. 2 foundry advanced its prices 25 cents within the week past. There is now only one price for local iron and that is $13.50. The melt of iron in all sections of the West has increased in the past two weeks, as shown by the volume of shipping instructions received by sellers. Producers with stocks on hand are rapidly depleting them, notably those north of the Ohio River, one of these interests stating that its pile has diminished at the rate of over 1,000 tons a month. Furnaces in the South that have kept their yards well cleaned up, find themselves getting behind in their shipments as a result of the decreased output due to the coal miner's strike. Malleable iron is firm, though without change in price. Lake Superior charcoal has advanced 50 cents a ton, and is now being offered by local sellers at $15 Chicago. We quote as follows:

Lake Superior Charcoal	$ 15 00
Northern Coke Foundry No. 1	13 75 to 14 00
Northern Coke Foundry No. 2	13 25 to 13 50
Northern Coke Foundry No. 3	12 75 to 13 00
Northern Scotch Foundry	15 00 to 15 50
Ohio Strong Softeners No. 1	14 50 to 15 00
Ohio Strong Softeners No. 2	14 00 to 14 50
Southern Coke Foundry No. 1	13 65
Southern Coke Foundry No. 2	13 15
Southern Coke Foundry No. 3	12 90
Southern Coke Foundry No. 4	12 65
Southern No. 1 Soft	13 65
Southern No. 2 Soft	13 15
Southern Gray Forge	12 40 to 12 65
Southern Mottled	12 15 to 12 40
Southern Silveries (4% to 6% Silicon)	14 85 to 15 85
Jackson Co. Silveries (8% to 10% Silicon)	17 80 to 18 30
Alabama and Georgia Car Wheel	18 85 to 19 35
Malleable Bessemer	13 50 to 13 75
Alabama Basic	13 15 to 13 40

Billets.—Demand for billets is at low ebb, the only sales reported being several small lots for axle and forging purposes. An inquiry for 500 tons of rolling billets was out a few days ago, but was not placed in this market because the buyer wanted a price at least $4 a ton below the official schedule. Wire rods are hard to obtain, and producers are holding prices. On small lots $29 Chicago is asked, but on more desirable tonnages this might be shaded from 50 cents to $1 a ton. Although the "official" billet schedule is not being lived up to in this market, we quote it as a basis: Bessemer and open-hearth, 4 x 4 and larger, up to .25 carbon, $24; up to and including .60 carbon, $1 extra. Billets, 3⅞ inches and smaller, and sheet and tin bars, $25.

Bars.—Specifications for both iron and steel bars are fair but much below the tonnage of the past two or three weeks. Buyers are cautious in making contracts for new business, the numerous reports as to the probability of lower prices ruling later on having had a disturbing effect which is still felt in a marked degree. The Republic Iron & Steel Co. has closed down its mills for several days. Bar iron is firm at 1.35c Chicago, though some cutting in steel bars is still being done by a local interest. We quote on carload lots, mill shipments, Chicago delivery, as follows: Soft steel bars, 1.40c to 1.51½c; soft steel angles, less than 3 x 3, 1.61½c; hard steel angles rolled from old rails, 1.30c to 1.35c; hoops, 1.71½c. On small lots from store we quote bar iron, 1.75c base, full extras; steel bars, 1.70c to 1.80c base, half extras; hoops, 2.10c rates, full extras.

Sheets.—Sheet business is without life. Orders are slow in coming forward, and such as are booked are invariably for small lots. Buyers are purchasing on the hand to mouth policy, owing to the uncertainty of prices. Some mills anxious for business are making very low quotations on desirable orders. The prices which we give below, while nominally representing the market, may be shaded $1 a ton. With this reservation, we quote one pass, cold rolled, blue annealed sheets, carload lots, mill shipments, Chicago delivery, as follows: Nos. 9 and 10, 1.77½c to 1.79½c; Nos. 11 and 12, 1.79½c to 1.86½c; Nos. 13 and 14, 1.86½c to 1.91½c; Nos. 15 and 16, 1.89½c to 2.01½c. On box annealed, one pass, cold rolled: Nos. 18 and 20, 2.01c to 2.06½c; Nos. 22 and 24, 2.06½c to 2.11½c; Nos. 25 and 26, 2.11½c to 2.16½c; No. 27, 2.16½c to 2.21½c; No. 28, 2.26½c to 2.31½c; No. 29, 2.41½c to 2.46½c; No. 30, 2.51½c to 2.56½c. Jobbers report a fair demand for both black and galvanized sheets from stock. Prices are without change, and we quote as follows: No. 10 and heavier, 2c to 2.10c; No. 12, 2.05c to 2.15c; No. 14, 2.10c to 2.20c; No. 16, 2.20c to 2.30c; No. 18, 2.30c to 2.40c; No. 20, 2.30c to 2.40c; No. 22, 2.35c to 2.45c; No. 24, 2.40c to 2.50c; No. 26, 2.50c to 2.60c; No. 27, 2.60c to 2.70c; No. 28, 2.70c to 2.80c; No. 29, 2.85c to 2.95c. Galvanized sheets are quiet, and we quote Pittsburg discounts, f. o. b. mill, 80 and 5 to 80 and 10. For shipments from local store, 75, 10 and 5 to 80 percent.

Structural Steel.—The uncertainty of the past week regarding the outcome of the pool meeting which is being held in New York today has resulted in an almost total disappearance of specifications or orders. No improvement is looked for until the question is settled. Up to this writing no change has been announced and we quote the association schedule as follows: Bessemer and channels, 16 inches and under, 1.76½c; 18 inches and over, 1.86½c; universal plates, 1.76½c; angles, 3 x 3 and larger, 1.81½c; zees, 1.76½c. On lots from store, we quote beams, channels and angles, 3 x 3 and larger, 2c; beams, 18, 20 and 24-inch, 10c extra; tees, 2.05c rates.

Plates.—Plate mills are also suffering from a lack of business as a result of the postponed pool meeting. The South Chicago mill is still running, however, working on specifications received some weeks ago. We continue to quote pool prices, although a change may be made before this is published. On carload lots, mill shipments, Chicago delivery, the association prices are: Tank steel, ¼-inch and heavier, 1.76½c; flange steel, 1.86¼c; marine, 1.90½c; universal mill plate, 1.76½ to 1.81½c; 3-16-inch, 1.86½c; Nos. 7 and 8, 1.19½c; No. 9, 2.10½c; No. 10, 1.91½c; No. 11, 1.96½c; No. 12, 2.01½c. From store, we quote tank steel ¼-inch and heavier, 2c; 3-16, 2.10c; No. 8, 2.15c; No. 10, 2.15c; flange steel, 2.25, all f. o. b. warehouse.

Rails and Track Supplies.—Orders for nearly 20,000 tons of standard sections have been placed with corporation mills in the week under review, 10,000 tons of which are for a new company engaged in building a road between Salt Lake City and Los Angeles. Specifications from the large western systems are not as heavy as might be desired, and it is expected that a large undelivered tonnage will be carried over into the new year. Track supplies and light rails are fairly active. There are no

changes in prices, and we quote, as follows: Heavy sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality rails, $27; light rails, $22 to $24; track supplies, f. o. b. Joliet mill, angle bars, 1.35c; spikes, first quality, 1.65c to 1.75c; track bolts, 3½ x ¾, with square nuts, 2.20c to 2.30c per 100 lb.; with hexagon nuts, 2.35c to 2.45c.

Merchant Steel.—Specifications have been of good volume during the week under review, the implement trade ordering freely. New business is light, the greater portion of the trade having covered for their season's requirements. Prices are without change, and we quote carload lots, mill shipments, Chicago delivery, as follows: Spring steel, 1.90c; sleigh shoe, flat sizes, 1.56½c; concave and convex, 1.76½c; cutter shoe, 2.25c; smooth finished machinery steel, 1.76½c base; smooth finished tire, 1.71½c; plow steel, 2.20c and upward according to quality; toe calk, 2.06½c base. Ordinary grades of crucible tool steel, 6½c to 8c; special tool steel, 12c up. Cold rolled shafting, 52 percent from list in carload lots, and 47 percent discount in less than carload lots.

Merchant Pipe.—Mills report an active demand for all sizes of pipe, the tonnage taken in the past week being the best for several weeks. A new schedule of prices went into effect Saturday, Sept. 3, being a reduction of from 2½ to 7½ percent. We have revised our quotations and quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel Pipe		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
¼ and ⅜ inches	69.35	53.35	67.35	51.35
½ and ¾ inches	73.35	71.35	71.35	69.35
1 to 6 inches	77.35	67.35	75.85	65.85
7 to 12 inches	72.35	57.35	70.85	55.85

Boiler Tubes.—Business has shown a marked increase in the week under review, and gives indications of a brisk trade through the balance of the year. Prices are without change, and we quote carload lots, mill shipments, as follows:

BOILER TUBES.

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ inch	46.35	41.35	52.35
1¾ to 2¼ inch	58.35	41.35	40.35
2½ inch	60.35	46.35	43.35
2¾ inch to 5 inch	66.35	53.35	Up to 4 inches.
6 to 13 inch	58.35	41.35	50.85

The following are the agreed discounts from store, Chicago:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches	42½	37½	40
1¾ to 2½ inches	52½	35	37½
2½ inches	55	37½	40
2¾ to 5 inches	62½	47½	47½
6 inches and larger	62½	35	..

Cast Iron Pipe.—Routine business is of good volume, the aggregate sales making up a tonnage of fair proportions. The leading interest reports having closed an order for 14,000 feet of 12-inch pipe for the city of Rockport, Ohio. Some good sized lots are pending, including 750 tons for Portland, Ore., and 500 tons for Portage la Prairie, Manitoba. Prices are without change, though the following quotations may be shaded slightly on desirable orders. We quote 4-inch water pipe, $25.50; 6-inch to 12-inch, $24.50; larger sizes, $24; gas pipe, $1 a ton higher.

Wire Products.—An active demand exists for all classes of wire materials, mills being hard pressed for prompt shipments. Jobbers in the northwest are specifying heavily on their contracts for nails and fencing, many of them having permitted their stocks to run down during the period prior to the change in prices. These interests have since swamped producers with requests by mail, telephone and telegraph for larger shipments, and, as a consequence, the latter are compelled to divide their tonnage to meet the most pressing wants. We quote carload lots to jobbers, mill shipments, Chicago delivery, as follows: Wire nails, 1.75c; painted barb wire, 1.90c; galvanized barb wire, 2.20c; smooth annealed wire, 1.60c; smooth galvanized wire, 1.90c; polished staples, 1.85c; galvanized staples, 2.15c. Less than carload lots to jobbers are five cents higher than above prices. The retail trade is quoted five cents extra than the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Foundry Coke.—A fair demand exists for both Connellsville and Virginia grades, though it is not of an urgent nature. Western melters are buying on the hand to mouth policy, carload orders predominating. We quote coke from Wise County (Va.) district, $2 to $2.25, at the ovens, or $4.25 to $4.50 Chicago. Coke from the Pocahontas and New River districts, the freight rate of which is $2.65 to Chicago, are offered on the basis of $1.70 to $1.90 at the ovens. Standard 72-hour Connellsville grades are firm at $2 at the ovens, or $4.65 Chicago.

Old Material.—Despite the weakness in finished material, prices of scrap are holding up well. This is due largely to the attitude of dealers and not because of the demand from consumers, who are buying very little at the present time. Railroad lists are eagerly snapped up by dealers and the material taken out of the market, being stored away in anticipation of a more active market and higher prices which it is expected will be realized later on. The only new railroad list that has been sent out in the past week is one from the Wisconsin Central, offering about 500 tons of material. Old iron rails, Nos. 1 and 2 R. R. wrought, No. 1 cast, iron car axles, railroad malleable, agricultural malleable and stove plate have all been advanced 50 cents over our quotations of last week. These are as follows:

Old iron rails	$15 50 to 16 00
Old steel rails (4 feet and over)	11 50 to 12 00
Old steel rails (less than 4 feet)	10 00 to 10 50
Relaying rails, subject to inspection	21 50 to 22 50
Relaying rails for sidetracks	18 00 to 20 00
Old wheels	11 00 to 12 00
Heavy melting steel	9 50 to 10 00
Mixed country steel	7 00 to 7 50

The following quotations are for net tons:

Low phosphorus scrap (.04 and under)	$12 00 to 13 00
No. 1 R. R. wrought	12 00 to 12 50
No. 2 R. R. wrought	11 00 to 11 50
Shafting	12 50 to 13 00
Dealers' Forge, No. 1	9 00 to 10 00
Wrought pipe and flues	8 00 to 8 50
No. 1 cast, 150 lb. and less	10 00 to 10 50
Heavy cast	8 00 to 8 25
No. 1 mill	6 00 to 6 50
Country sheet	5 00 to 5 50
No. 1 boilers, cut	7 50 to 8 00
Boiler punchings	9 00 to 9 50
Iron car axles	15 50 to 16 00
Steel car axles	13 50 to 14 00
Iron axle turnings	7 50 to 8 00
Steel axle turnings	7 00 to 7 50
Cast borings	4 00 to 4 50
Mixed borings, etc.	4 00 to 4 50
Wrought turnings	7 00 to 7 50
Machine shop turnings	7 00 to 7 50
Railroad malleable	9 00 to 9 50
Agricultural malleable	8 50 to 9 00
Stove plate and light cast scrap	8 25 to 8 75
Old iron splice bars	13 00 to 13 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Sept. 7.

Iron Ore.—Shipments from upper lake ports for August show a decrease of 92,627 tons compared with August of last year. The decrease to Sept. 1 is 0,813,858 tons. The August shipments by ports were:

	1903.	1904.
Escanaba	704,883	711,756
Gladstone	14,714	
Marquette	371,261	366,172
Ashland	516,595	389,043
Superior	602,756	807,278
Duluth	1,020,185	865,090
Two Harbors	873,817	872,245
	4,104,211	4,011,584

The shipments of the seasons to Sept. 1 were as follows:

	1903.	1904.
Escanaba	2,849,471	1,698,308
Gladstone	40,656	480
Marquette	1,411,825	818,010
Ashland	1,050,659	967,969
Superior	2,684,737	1,916,477
Duluth	3,766,030	2,148,919
Two Harbors	3,726,476	2,065,833
	16,429,854	9,615,996

Sales of ore are being made slowly at $2.35 to $2.50 for non-Bessemer Mesabis, $2.75 to $3 for old range, while old range Bessemer sell at $3 to $3.25 and Mesabi Bessemers at $2.75 to $3. Freight rates are unchanged from last week at 65 cents from the head of the lakes, 55 from Marquette and 50 from

Escanaba. The fact that no work was done on the docks on Sunday or Monday did not cause any congestion at lower lake ports, but there is much delay at the head of the lakes, which is making the season very unprofitable for some of the vessels.

Pig Iron.—Although sales are few and inquiries not numerous, the market shows no little strength under unfavorable conditions. For No. 2 foundry, few furnaces will accept less than $12 and some are asking $12.25, but it is probable that iron can still be purchased at $11.75. The local price for Cleveland delivery is $12.25 to $12.50. The demand for deliveries on old contracts continues as a favorable condition. Southern prices are still $9.25 to $9.50 Birmingham, for No. 2. We quote as follows for Cleveland delivery:

Bessemer	$12 60 to 12 75
No. 1 Strong Foundry	12 85 to 13 00
No. 2 Strong Foundry	12 60 to 12 85
No. 3 Foundry	12 25 to 12 50
No. 2 Southern	13 10 to 13 35
Gray Forge	11 85 to 12 00
Gray Forge, Southern	12 00 to 12 15
Lake Superior charcoal	14 50 to 15 00

Finished Material.—Extreme dullness has continued, pending expected reductions in prices. As the announcement of concessions has not become generally known, it is too early to predict the result. These reductions are: Sheared plates and universals above 24 inches, from 1.60c to 1.40c; universal plates under 24 inches and grooved rolled plates, from 1.60c to 1.30c; structural material, from 1.60c to 1.40c. Steel bars at 1.44½c, Cleveland, for Bessemer and 1.49½c for open-hearth have shared the general dullness and will not be in strong demand unless reductions are made. Bar iron is quiet, with prices irregular, but usually about 1.25c at the mill. Sheets have not changed. The prices of the principal producers through jobbers are as follows, Cleveland delivery, the freight from Pittsburg being 9½ cents. Mill sales of black sheets in carload lots, No. 10, 1.64½c; No. 11-12, 1.69½c; No. 14, 1.79½c; No. 16, 1.89½c; No. 27, 2.14½c; No. 28, 2.24½c. Galvanized, mill sales, No. 14, 2.24¼c; No. 16, 2.34½c; No. 18-20, 2.49½c; No. 22-24, 2.64½c; No. 25-26, 2.84½c; No. 27, 3.04½c; No. 28, 3.24½c. Out of stock, black sheets: ¼-inch, 1.90c; 3-16-inch, 2c. Blue annealed: No. 10, 2.05c; No. 12, 2.10c; No. 14, 2.15c; No. 16, 2.25c. One pass cold rolled: No. 18-20, 2.35c; No. 22-24, 2.40c; No. 26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 30, 3c. Galvanized out of stock: No. 16, 2.60c; No. 18-20, 2.70c; No. 22-24, 2.85c; No. 26, 3.05c; No. 27, 3.25c; No. 28, 3.45c; No. 30, 4.25c.

Almost the only signs of activity in the finished material lines are among the jobbers, who have enjoyed very good trade from stocks.

Old Material.—The demand for mill scrap has increased slightly, but prices have not advanced and the market in general is very quiet. We quote as follows for Cleveland delivery:

Old iron rails	$15 00 to 15 50
Old steel rails (over 6 feet)	12 00 to 13 00
Old steel rails (under 6 feet)	11 00 to 12 00
Old car wheels	10 00 to 11 00
Steel boiler plate	9 00 to 10 00
Malleable iron (railroad)	10 00 to 10 50
Malleable iron (agricultural)	8 00 to 9 00
Heavy steel	10 00 to 11 00

We quote as follows, net tons:

No. 1 R. R. wrought	$10 00 to 11 00
No. 1 busheling	9 50 to 10 00
No. 1 machine cast	9 50 to 10 50
Iron axles	16 00 to 16 50
Axle turnings	7 00 to 8 00
Wrought turnings (free from cast)	6 00 to 6 50
Grate bars	7 00 to 8 00
Pipes and flues	8 00 to 8 50
Tank iron	7 50 to 8 00
Hoop and band iron	5 00 to 5 50
Sheet iron	4 00 to 5 00
Wrought drillings	6 00 to 6 50
Stove plate	8 00 to 9 00
Steel axles	13 00 to 14 00
Cast borings	3 50 to 4 00

CINCINNATI.

Sept. 7.

The demand for coke has been moderate the past week and the market ruled quiet and unchanged. Connellsville brands are quoted from $1.80 to $2.10 f. o. b. Connellsville for foundry coke.

Pig Iron.—The week has developed nothing new in the general situation. The current run of orders has been small and business quiet. But few inquiries of importance have come out. Some Southern iron is still wanted in the North to use in mixtures even at prices that would be prohibitive against Northern irons under other circumstances. An inquiry for 3,000 tons of No. 2 Southern soft for delivery in the first half of next year comes from a Northern buyer; another inquiry for 1,500 tons of No. 2 and No. 3 foundry comes from a Michigan point. A manufacturer in Indiana asks for prices on 2,000 tons of Southern iron for delivery over the last quarter of this year. Quotations are being made on 500 tons for a Michigan concern for prompt shipment. There are negotiations pending for a round lot of from 5,000 to 20,000 tons of Southern iron to be used strictly for re-sale or speculative purposes. There has been but little change in the price situation, but it may be said that $9.25 Birmingham is now heard more frequently in the trade. For Northern iron the general asking price is $12 furnace for No. 2, but some of the furnaces are shading this figure and sales have been made as low as $11.50 furnace on attractive business. Advices from Birmingham indicate that no early settlement of the strike may be looked for, and the operators are apparently determined to fight it out. So long as the strike continues no change in the prices for Southern iron is expected, as there is not enough being made now to depress the market. The demand for foundry iron in this territory has been lighter the past week than for some time. The local melt is light at best and is further curtailed by a strike of the molders in a number of the foundries. Through the territory covered by traveling men from here the consumption of iron is reported as fair, but the plants seem to be provided with enough iron for current needs, and trade languishes. We quote in carload lots f. o. b. Cincinnati:

Southern Foundry No. 1	$12 50 to 12 75
Southern Foundry No. 2	12 00 to 12 25
Southern Foundry No. 3	11 50 to 12 00
Southern Foundry No. 4	11 00 to 11 25
Southern Foundry No. 1 soft	12 50 to 12 75
Southern Foundry No. 2 soft	12 00 to 12 25
Gray Forge	11 00 to 11 25
Northern Foundry No. 1	13 15 to 13 65
Northern Foundry No. 2	12 65 to 13 15
Southern car wheel iron	16 25 to 16 50

Finished Material.—The market has shown no particular change during the week and trade has been quiet. Structural yards are finding a fair demand for odds and ends to fill out on work nearing completion. Buyers only take enough for current needs. Bar iron is still quoted at 1.35c; steel bars at 1.48c, half extras, with dealers quoting 1.60c to 1.75c for iron and steel out of store. Galvanized sheets are at 75 and 10 to 75, 5 and 2½ percent off. We quote black sheets, No. 27, at 2.25c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.60c; No. 27, 2.50c; No. 16, 2.20c; No. 14, 2.20c; No. 12, 2.10c; No. 10, 2.05c. Tank plates are dull and sell out of store at 2c for ¼-inch, 3-16-inch, No. 8 and No. 10. Beams and channels are quoted at 2c from stock and angles at 1.90c to 2c for base sizes.

In merchant pipe there has been a revision of prices which in the main is a slight advance on the smaller sizes and a reduction on the larger sizes. Boiler tubes are unchanged, but prices are only quoted on specifications. Carload lots are quoted as follows f. o. b. Cincinnati:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼ inch	69.7	53.7	67.7	51.7
⅜, ½ inch	73.7	61.7	71.7	59.7
¾ to 6 inch, inclusive	77.7	67.7	76.2	66.2
7 to 12 inch, inclusive	72.7	57.7	71.2	55.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
to 1½ inch	41.2	37.7
1¾ to 2¼ inch	54.2	36.7
2½ inch	56.7	41.7
2¾ to 5 inch	63.2	49.2
6 to 13 inch	54.2	36.7

Old Material.—The market is dull and prices are largely nominal in the absence of trading. There is very little inquiry and it is mainly a dealer's market. We quote:

Old No. 1 railroad wrought, net tons	$11 00 to 11 50
Cast machine and foundry, net tons	9 50 to 10 00
Old iron rails, gross tons	12 50 to 13 00
Old steel rails, gross tons	9 50 to 10 00
Old short lengths, gross tons	10 00 to 10 50
Old iron axles, net tons	13 50 to 14 00
Stove plate, net tons	6 00 to 6 50
Wrought turnings, net tons	6 00 to 6 50
Cast borings, net tons	3 00 to 3 50

NEW YORK.

(Special Telegram.)

NEW YORK, Sept. 7.—The structural pool concluded its session yesterday by making a cut of $4 per ton and by receiving the Lackawanna Steel Co. as a member. The plate pool decided upon a reduction of from $4 to $6 per ton, the latter covering 24-in. and under, both for carload lots and less. The new base schedules for structural material and plates, which become operative at once, are f. o. b. New York as follows: Angles, 3 to 6 in. x ¼ in. and heavier, 1.54½c; beams, 3 to 15 in., 1.54½c; channels, 3 to 15 in., 1.54½c; beams, 18, 20 and 24 in., 1.64½c; tees, 3 x ¼ in. and heavier, 1.59¼c; tank plates, over 24 in. x ¼ in. and heavier, carload lots, 1.54½c; same, less than carloads, 1.59½c; tank plates, 24 in. and under, ¼ in. and heavier, carload lots, 1.44½c; same, less than carload lots, 1.49½c.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Sept. 7.

Pig Iron.—The market during the past week was quiet, with other causes contributing besides the practical suspension of business for two days. Sales did not make much in the aggregate, and inquiries were very backward. Northern makers continue to get the bulk of the orders that are placed, being able to undersell their Southern competitors by at least 25 cents. Another advantage Northern producers have is their ability to make shipments within a few days, whereas an order placed with a Southern company rarely results in a shipment being made before three weeks. Southern interests find this an insurmountable handicap in a market where buying is on a hand-to-mouth basis, and prices have a weak undertone. The feature of the week is the announcement by the leading Southern maker of its willingness to take orders for delivery the remainder of the year on the Birmingham basis of $10 for No. 1 foundry, $9.50 for No. 2, $9 for No. 3, and $8.75 for No. 4. These are the prices this company has been quoting for several months past. As for the market in general there is nothing especially encouraging to report, advices from foundrymen continuing unfavorable. New York quotations follow: Northern No. 1 X, $14.50 to $15; No. 2 X, $14 to $14.50; No. 2 plain, $13.50 to $14; Southern No. 1 foundry, $13.50 to $13.75; No. 2 foundry, $13 to $13.25; No. 3 foundry, $12.50 to $12.75; No. 4 foundry, $12.25 to $12.50.

Finished Iron and Steel.—All branches of the finished material market have been in a state of suspense pending the outcome of the meeting of the various pools in Jersey City. Yesterday the structural pool met and adjourned until today without any definite agreement. As this is written a reduction from 1.60c Pittsburg to 1.40c Pittsburg is announced. This is only a moderate reduction from the 1.60c base, Pittsburg. The American Bridge Co.'s August business amounted to between 40,000 to 50,000 tons, which was a decided improvement over July. With price schedules fixed the present month has an attractive outlook.

The plate pool meeting today resulted in reductions of $6 a ton on plates narrower than 24 inches and $4 a ton on plates 24 inches and wider. Bars and sheets show no additional weakening in price, but new business is at a low ebb. It is said the billet pool will meet this week. We quote as follows for New York delivery: Beams and channels, 15-inch and under, 1.75c to 1.80c; angles, 3 to 6 inches, 1.75c to 1.80c; zees, 1.75 to 1.80c; bulb angles, 2.05c to 2.25c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 174½c to 1.80c; flange, 1.84½c to 1.90c; firebox, ordinary, 1.94½c to 2c; refined iron and soft steel bars, 1.49½c; sheets, in carload lots New York, No. 28, black, 2.25c to 2.30c; galvanized, 3.25c to 3.30c.

Old Material.—Prices remain firm, with more material changing hands than could be noted the week previous. The present months is expected to bring about increased activity and higher prices, but feeling that it will is not as strong as it was a few weeks ago. There is an excellent demand for stove plate, of which there appears to be very little in the market. Prices f. o. b. cars follow:

Old iron rails	$14 00 to 14 50
Old steel rails, long lengths	11 75 to 12 50
Old steel rails, short pieces	11 00 to 11 50
Relaying rails	19 00 to 20 00
Old car wheels	11 50 to 12 50
Old iron car axles	17 00 to 18 00
Old steel car axles	14 00 to 14 50
Heavy melting steel scrap	11 50 to 12 00
No. 1 railroad wrought scrap	11 50 to 12 00
Iron track scrap	10 50 to 11 00
Wrought pipe	7 75 to 8 25
Ordinary light iron	4 50 to 5 25
Cast borings	3 50 to 4 00
Wrought turnings	5 50 to 6 00
No. 1 machinery cast	9 00 to 10 00
Stove plate	7 75 to 8 25

PHILADELPHIA.

Sept. 7.

Pig iron has held its own pretty well during the week, but the meetings of pool representatives in New York to decide upon proposed reductions in prices of shapes and plates have naturally prevented buying in finished lines. Reports from Europe concerning iron and steel are not encouraging, as German manufacturers have reduced prices to compete with American products.

Pig Iron.—There is a fair demand for small lots. Southern furnaces are practically out of the market and this fact helps the northern plants. Production is about equal to consumption at present. Prices show no change. We quote as follows: No. 1 X Foundry, $14.75 to $15.25; No. 2 X Foundry, $14.25 to $14.50; No. 2 Plain Foundry, $13.50 to $13.75; standard gray forge, $13 to $13.25; ordinary gray forge, $12.50 to $12.75; basic, $12.75 to $13.

Finished Material.—Business has been checked by the prospect of lower prices and there is now some difference of opinion as to what will be the result of the concessions on plates and shapes announced today. We revise quotations as follows for Philadelphia delivery: Refined bar iron, 1.48½c; plates, more than 24 inches, 1.52½c; under 24 inches, 1.42½c; structural material, 1.52½c.

Old Material.—The market is quiet and prices are inclined to soften. We quote as follows: No. 1 steel scrap, $12 to $12.50; low phosphorus scrap, $16 to $16.50; old steel axles, $15 to $15.50; old iron axles, $18 to $18.50; old iron rails, 15.50 to $16; old car wheels, $12 to $12.50; choice railroad No. 1 wrought, $14 to $14.50; machinery cast, $11.50 to $12.25; No. 2 light scrap (forge), $10 to $10.50; No. 2 light scrap (ordinary), $8 to $8.50; axle turnings, $9 to $9.50; wrought turnings, $8.50 to $9.25; cast borings, $6.50 to $7; stove plate, $9 to $9.50; wrought iron pipe, $10.50 to $11.25.

BIRMINGHAM.

BIRMINGHAM, Ala., Sept. 5.—The pig iron production in Alabama has been further curtailed. The Tennessee Coal, Iron & Railroad Co. has banked its Oxmoor furnace on account of the slow delivery of coke from Virginia, where the product is being purchased while the coal miners' strike is on in this State, and the Tutweiler Coal, Iron & Railroad Co. has blown out its Vanderbilt furnace, near the city, for the purpose of making necessary repairs about the plant. The Tutwefler company will add a new blowing engine, repair the old engine, enlarge and reline the furnace, making a furnace with 150 tons daily capacity when the work is completed.

The strike of the union coal miners continues. The operators have secured federal injunctions to prevent the leaders of the miners from interfering with their labor and considerable non-union labor is now being brought to the district to take up the work of the strikers in the mines. The furnace operators declare that this is a fight to death and that the matter has narrowed down to a fight against labor and for the "open shop." Both the operators and the striking miners still claim to be gaining ground. During this week the operators intend bringing into the district a couple of thousand hands from Kentucky, Tennessee and other States and expect to produce coal in better quantities than ever before since the strike began. There are five furnaces in the district ready to be started up on a day's notice, the strike of the miners holding them back.

The Tennessee Coal, Iron & Railroad Co. has five furnaces in operation and the greater portion of the iron being made is basic iron for the steel plant. The Alabama Consolidated Coal & Iron Co., the only furnace company signing the union miners' wage contract, has three furnaces in full operation, two at Ironaton and one

at Gadsden. The Sloss-Sheffield Steel & Iron Co. has five out of seven furnaces in full blast and the work on the furnace blown out for repairs last month is being pushed so as to complete it at the earliest possible moment. The Republic Iron & Steel Co. has only one out of three furnaces at Thomas in blast. The other two furnaces at Thomas are ready to be started up but the coal situation holds them back. The Lacey-Buek Iron Co. has its one furnace in blast. The Shelby Iron Co. (charcoal iron) has one of its furnaces in blast.

There is a fair inquiry for iron in this district. While the sales are not in large lots, it is stated that the aggregate is good. Second Vice President J. W. McQueen, of the Sloss-Sheffield Steel & Iron Co., when asked as to the iron market conditions, replied that they were good, considering conditions locally, and that there was a healthy inquiry, steady demand and the quotations firm. He predicts a steady market through the year.

The following quotations for iron are given in this section: No. 1 foundry, $10; No. 2 foundry, $9.50; No. 3 foundry, $9; No. 4 foundry, $8 to $8.50; gray forge, $8; No. 1 soft, $10; No. 2 soft, $9.50.

The only work being done in rolling mills in this section is that in two of the departments of the Tennessee Coal, Iron & Railroad Co. mills at Bessemer, 12 miles south of the city. Efforts are being made by the Amalgamated Association of Iron, Steel and Tin Workers to settle differences at this plant, non-union men being employed by the company. Mill men hereabouts are still anxiously waiting the result of the meeting of the conciliatory board.

Cast iron pipe manufacturers have no cause for complaint, their plant being in steady operation and a good demand for all the product being made here. Good prices also obtain for cast iron pipe. The Isthmian canal commission advertises in this section for bids on large quantities of cast iron soil pipe and fittings, and it is believed there will be some effort made by Birmingham producers to get a portion of this business at least.

The Metal Market.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Sept. 7.

All departments of the metal trade are quiet, buyers covering for their requirements cautiously. Copper is off ⅛ of a cent, while spelter has advanced ⅛. We quote prices as follows: Lake copper, carloads, 12⅞c, and for smaller lots, 13⅛c; casting, 12⅝c for carloads, and 13c for lesser quantities. Pig tin, 28¼c to 28¾c, according to quantity. Spelter, 5⅛c to 5⅜c, according to quantity; sheet zinc, 6c for carload lots of 600-pound casks, and 6.25c to 6.35c for less than carload lots. Pig lead, 4.20c or 50-ton lots, 4.25c for carload lots, and 4.35c for smaller lots.

Demand for old metals is more active, and prices are stronger. We have revised our quotations, and quote copper wire and heavy, 11c; copper bottoms, 9¾c; copper clips, 10¾c; red brass, 9½c; red brass borings, 7¾c; yellow brass, heavy, 7¼c; yellow brass borings, 6¼c; light brass, 5½c; tea lead, 3½c; zinc, 3.55c.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Sept. 7.

Pig Tin.—The market during the past week has been exceptionally strong, prices at this writing being nearly 1 cent higher than a week ago. The advance has been due to the publication of the monthly statistics, the decrease in the visible supply being an unexpectedly strong feature. General business, however, continues only fairly active. The London market, for the reasons mentioned, is nearly £4 higher than a week ago. Today's closings follow: Spot and September, 27.60c to 27.70c; October, 27.50c to 27.70c. London's closings today follow: Spot, £126 2s 6d; futures, £126 10s. Arrivals for the month to date aggregate 440 tons, with 1,900 tons afloat.

Copper.—Prices remain the same as last week, and there are no developments of fresh interest in the trade situation. Exports continue the bright feature, and it is predicted that they will reach 17,000 tons during the present month. The London market improved slightly during the week. Today's closings follow: Lake, 12⅝c to 12¾c; electrolytic, 12½c to 12¾c; casting, 12⅜c to 12½c. London's closings today follow: Spot, £57 10s; futures, £57 11s 3d. Exports for the month to date aggregate 768 tons.

Lead.—Spot is slightly firmer at 4.20c to 4.30c. St. Louis a trifle weaker at 4.12½c. London unchanged at £11 3s 9d.

Spelter.—Is scarce and higher at 5.00c to 5.12½c. St. Louis is stronger at 5.00c. London advanced to £22 12s 6d.

Antimony.—Both Cookson's and Hallett's are 7c asked. Other grades are 6c asked.

Quicksilver.—We quote $42 per flask of 76½ pounds in lots of 100 flasks. London is £7 15s.

Nickel.—Sales are made at 40c to 47c for large lots down to a ton, and at 50c to 60c for smaller quantities.

LAKE SUPERIOR IRON MINES.

Sales of Malta ore have been made on a scale sufficient to operate the property all season and require a continuance into winter. These have been at a better price than has prevailed in the standard Mesabi Bessemer list for some time, and are encouraging for others of like character. The mine was reopened this week and a force aggregating 200 men will be employed for the year.

At McKinley, Minn., the Elba is shipping gradually from stock, but not fast enough to take away the 65,000 tons on hand and much of it will go over the winter. Corsica, an adjoining property also of Pickands, Mather & Co., has a stock pile of about 20,000 tons that has not been touched.

Bids for stripping the Grant mine, central Mesabi, are not yet opened, but contracts will be made in a short time. While it is estimated there are 4,000,000 yards of overburden, it is not probable that this will all be included in an initial contract. This overburden runs up to 70 ft. in thickness and the stripping job will be one of the largest ever undertaken on the Mesabi range.

At Monroe mine, where the Oliver Iron Mining Co. is stripping, a large surface for milling the mine, No. 1 shaft house is well along. This is set on concrete piers, an innovation so far as the Mesabi is concerned. Another shaft house for Monroe and one for Tener, the western end of the same mine, are under way. Tener is a forty-acre tract in the same development but under a separate lease, and is distinct from the traffic contract with the Great Northern under which Monroe works. This road is grading to Monroe shafts, the grade being of earth taken out of Leonard pit, a mile west, where the Drake & Stratton Co. is stripping heavily. Tener ore will be handled by the Duluth, Missabe & Northern road, which is now at the property.

The name of Howard mine, which is being developed by the Oliver Iron Mining Co. for extensive operations the coming year, has been changed to "Myers" on account of a wish of some of the fee owners. This was formerly the Niles, and so appears on most of the maps. It is in the n.w. ¼ of the s.e. ¼ of section 22-58-20.

Negotiations are under way for the sale of the exploration in lot 6, section 6-58-15, to the Oliver Iron Mining Co. This is a small but excellent ore body and was explored by people of Virginia, Minn.

D. T. Adams and associates have begun exploration in the north tier of sections in 58-15, from which they drew out some years ago after finding the Meadow mine.

The exploration conducted for some months by G. A. St. Clair in section 6-58-15, has shown up about 6,500,000 tons of excellent non-Bessemer ore. This will probably be opened for mining the coming year. The structure of this ore is coarse and hard.

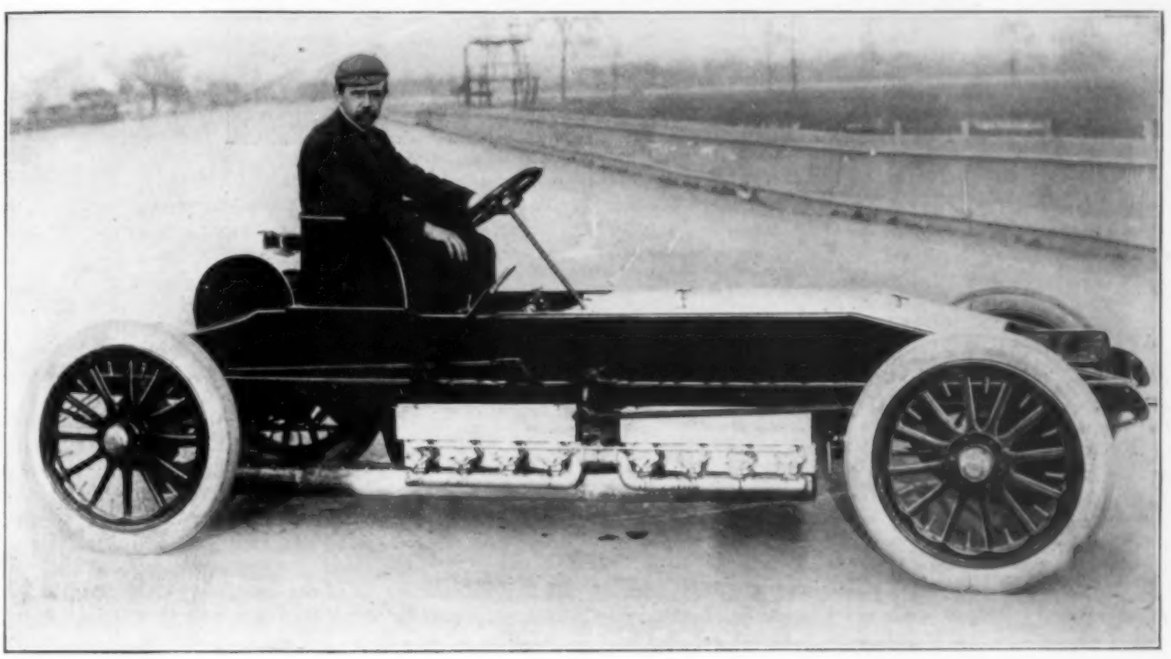
The Thomas furnace at Milwaukee is to go into blast soon, and Hiawatha mine at Iron River has resumed with a small force and will ship there. The mines has been idle for some months. This furnace is running on malleable and foundry irons.

A TYPICAL RACING MACHINE.

The recent records of track racing machines are sufficient excuse for a brief description of a famous automobile built by the Winton Motor Carriage Co. of Cleveland. The halftone is made from a previously unpublished photograph of the Bullet No. 2 with Alexander Winton at the steering wheel. This machine has a string of remarkable records which may be summarized as follows: One miles in 55 seconds at Los Angeles on Nov. 20, 1903; 15 miles in 14 min. 21 sec. at Denver on Oct. 29, 1903; one mile in 54 4-5 sec. at Los Angeles, Nov. 22, 1903; one mile in 54 sec. at Cleveland on Aug. 22, 1904, and one mile in 52 4-5 sec. at Cleveland on Aug. 22, 1904.

The car weighs 2,160 pounds and has eight cylinders 5¼ inches with 6-inch stroke. The eight-cylinder motor is placed lengthwise of the frame. This motor consists of two units of four cylinders each, which are connected by means of a flexible joint. The size and mechanism of each cylinder is a duplicate of the Winton touring car motor construction. One carburetor supplies the mixture for each unit of four cylinders. Only one coil is used for the ignition equipment of the entire battery of motors. The current passes to the new Winton type of distributer, from which it is commutated to the proper cylinder.

The cooling system consists of two tanks integral with the cylinder jackets; two separate circulating pumps, and a single radiator placed at the forward end of the car. The oiling is by the standard Winton system of positive feed lubrication. The gasoline tank is placed at the rear of the seat and has a capacity for 200 miles continuous running. The wheel base of the Bullet No. 2 is 9 feet 6 inches, with a standard tread of 4 feet 8½ inches. The wheels are equipped with 34 x 4½-inch tires.



THE WINTON RACING MACHINE.

From the motor the power passes through a positively operated internally expanding clutch to the longitudinal and telescopic drive shaft through a bevel pinion to a bevel gear on the differential gear case.

The rear axle is equipped with adjustable ball bearings throughout. There is no change speed gear in the system. The amount of power developed by this motor in combination with the Winton system of air governing and this particular clutch renders it possible to pick up the speed gradually and without jerk on the direct drive.

The brake control consists of a band brake on the flywheel and two sets of rear hub brakes, the outside hub brakes being friction bands and the inside brakes expanding friction bands. The clutch lever by the forward movement sets the brake similar to the high speed lever on the Winton touring car. A separate foot lever controls the flywheel brake. The frame construction is of armored wood, with body hangers of sheet steel. Both front and rear springs are semielliptical. The steering gear shaft extends through the body side and by a drop lever is connected to the upper right end of the right wheel steering knuckle through a horizontal link running parallel to the frame.

The Rough Aspect of Blast Furnace Plants.

Blast furnaces look bad enough at best. It strikes me that the rougher the output, the rougher everything is connected with the plant, including the employes. Much of the work around a furnace is, or used to be, both hot and laborious, and I believe, healthy. I have seen a man come out of a cast house in zero weather, his raiment consisting of gold earrings, a pair of pants and wooden shoes. He remained out long enough to cool off with no bad results following. This was about fifteen years ago. Recent improvements in machinery for handling pig iron, both liquid and solid, have dispensed with most of the labor of this kind, but as a rule the plants maintain their pristine ugliness. There is no good reason why blast furnace environment should be so uninviting. I believe that with the present economical use of the gas, shrubbery and grass will grow near some parts of the plant. It has been only in comparatively recent years that machine shops and other industrial plants have succeeded in shaking themselves out of this outside scrap pile appearance, and adorned the inside with sanitary conveniences. The result is general shop betterment. Nor does it stop there, but radiates in all directions for a few miles, and occasionally, with a shout of "Westward ho!" overtakes and gives "the man with the hoe" something to work with and for. With artistic surroundings, pleasant, clean and healthy shops, laziness and indifference on the part of the workman and greed and intolerance on that of the management will die for the want of a habitation.—[Amos Price in Power.

The Midvale Iron Works, of Lake Side, Wis., have been merged into the Stowell Mfg. Co., of South Milwaukee. The Lake Side plant is to be abandoned and all manufacturing done at South Milwaukee. R. A. Nourse, general manager of the Midland Iron Works, will be manager of sales of the consolidated company. The Midland Iron Works were organized in May, 1901, and have built up a large business. The output is chiefly the Wilbern adjustable door hanger.

COLBURN OVERHEAD CARRYING TRACK.

Among various ways adopted to reduce manufacturing expenses, overhead carrying systems are one of the most important. Material can be handled more cheaply and more quickly than by hand, a less number of men is required, and floor space is saved.

parts, the junction being rigid. In foundries where it is installed the pouring and other operations can be made continuous, each operation of the work being carried on separately and independently, one following the other as the work progresses.

A system of overhead tracking of this type furnished by the New Jersey Foundry & Machine Co., of New York, required

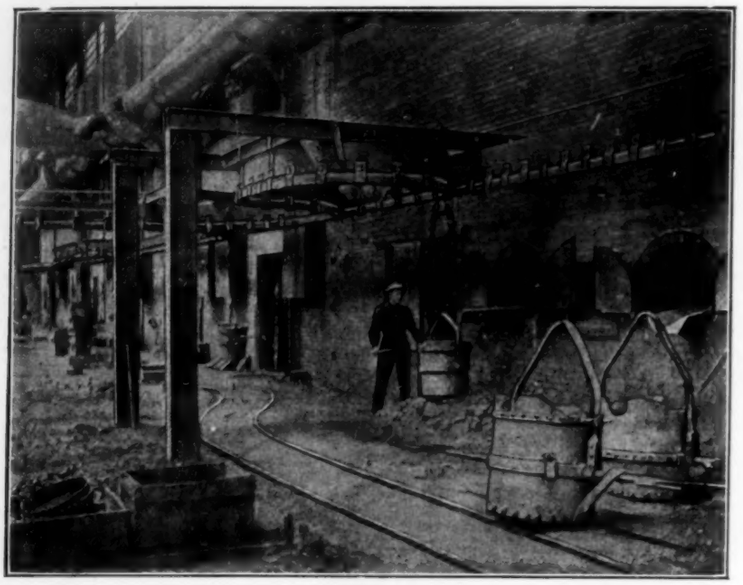


FIG. 1.—THE COLBURN OVERHEAD TRACK.

The Coburn hollow track is made of drawn sheet steel, and, as will be seen, is of a special form, the edges being turned inward and upward, forming a trough on each side in which the trolley wheels travel. This trough shape secures great strength and also offers a minimum resistance to the trolley wheels. It also insures the trolley traveling in the center of the track at all times; the wheels cannot come in contact with the sides of the track, nor the trolley pendant with the edges.

The track is open at the bottom only, so that the working parts are protected from dust and dirt and can be curved to a small radius around which the trolleys easily travel. The switches are positive in action, but one motion, a downward pull, being necessary to set the switch as desired. The trolleys are roller bearing.

In a foundry the track can be used for handling core boxes, drawing castings, placing copings, pouring metal, and carrying the castings to the cleaning room. With an overhead

between 500 and 600 ft. of track. This has been in satisfactory operation for some time.

Outlook for Rail Orders.

The officials of the Pennsylvania Steel Co. decline to discuss the recent contract for rails sold to the Canadian Pacific railway. Secretary Tenney has been quoted as follows in regard to general conditions: "Our business within the last six weeks has distinctly improved. Particularly has this been noticeable with the railroads. During the past ten days we have received orders for rails from four of the largest railroads in the country. They were small orders, to be sure, ranging from 2,000 to 5,000 tons, but were the first rails these corporations had purchased since the first of the year, thus disclosing the fact that their supply was exhausted, and that it is only the question of a short time when they will be in the market

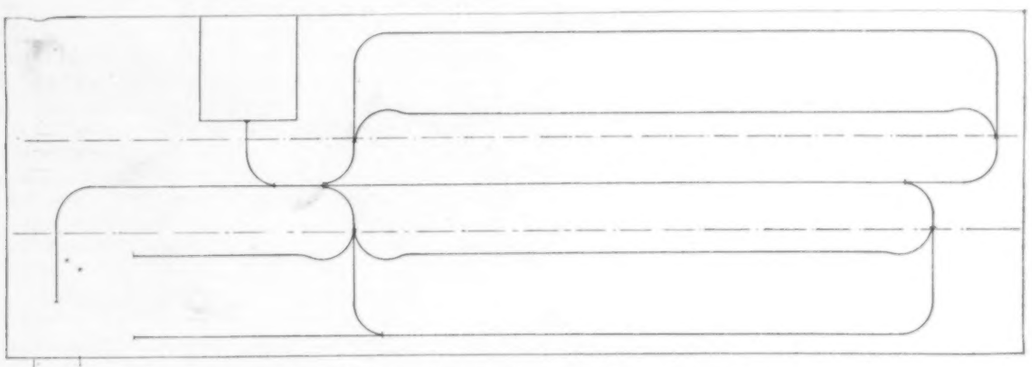


FIG. 2.—LAYOUT OF OVERHEAD TRACK FOR A FOUNDRY.

track system, one man can handle and pour a 2,000-lb. ladle of metal easier than two men could carry and pour a hundred pound ladle by hand. Work up to 5,000 or 6,000 pounds can be handled in this way, but for heavier work, crane service is desirable, though for special work the track can be furnished up to 14,000-lb. capacity. It allows lines to cross at right angles without the use of a switch, turning table, or movable

for rails again. The indications now are that there will be considerably more rails purchased next year than this."

The Leechburg, Pa., plant of the American Sheet & Tin Plate Co. resumed operations this week, after an extended idleness. The plants of the Pittsburg Shovel Co. and the West Leechburg Steel Co. at that place are operating in full.

DISCOMFORT VS. SKILL AS A WAGE BASIS.

BY THOMAS D. WEST.

[In the following article written recently for *American Industries*, Mr. West argues against the position that a chief consideration in fixing wages should be the prosecution of the work under comfortable conditions.]

In an interview which Frank G. Carpenter, the traveler and writer, had with Samuel Gompers, president of the American Federation of Labor, on questions of labor and capital, published in several papers of Sunday, Jan. 17, 1904, Mr. Carpenter asked, "What should govern in fixing wages?" Mr. Gompers replied: "The wages necessary to make the article under comfortable conditions should be that which fixes the price of the article, and not the price of wages."

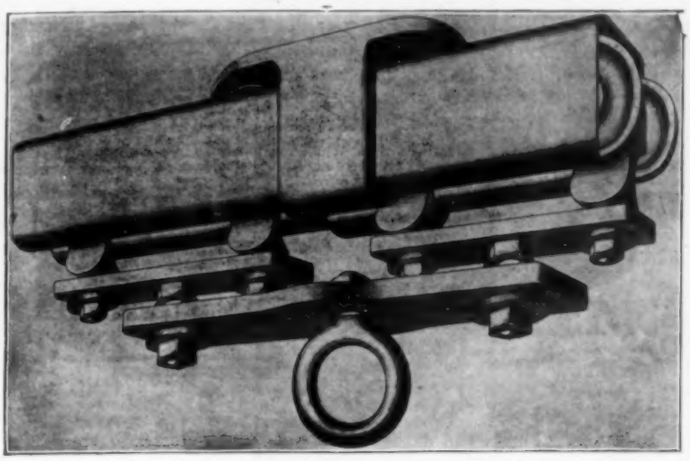


FIG. 3.—CARRIER FOR OVERHEAD TRACK.

If we could start tomorrow to try to make comfortable or agreeable conditions under which all labor was to fix the price of the article, it could never be achieved, no matter if capital should strive along with labor to attain such an end. How are we to make comfortable the labor of the locomotive engineer, who has to thrust his head out of a window when steam or smoke blinds his vision, to keep a vigilant eye on the track ahead of him; of the brakeman when he must open switches and flag trains in all kinds of severe weather, of the men who must be on the deck or in the rigging of ships in all kinds of storms and rolling seas? How are we to make labor comfortable for the puddler, who must face a fiery furnace, or for those who must stand at their forges and anvils during hot weather?

How shall we make comfortable the labor of the iron structural erector, who must climb the high places and cling to small rods and purlins, or of the roofer held by ropes on steep inclines, suffering the keen blasts of a cutting wind or heat of a scorching sun? Can we make comfortable the work of a boilermaker, who must stand the deafening clamor of the hammer and plate, or of the molders who stand the gases, dust and smut of the foundries?

How shall we make comfortable the labor of those who dig sewers, often standing in water and mud, or of those who go down in deep mines at the risk of their lives; of the teamsters who must go about early and late in all kinds of weather?

How can we make comfortable the labor of the men who go forth in battle on land and sea to protect our lives and country, or of the police who must suffer violence to uphold our civil laws?

How are we to make comfortable the labor of our firemen, who must imperil their lives to prevent loss of property or destruction of our homes by fire; or of those who man our lifeboats in raging waters?

"Comfortable" Labor Only Relative.

We could continue indefinitely depicting uncomfortable work. But were all the wealth of the world at our command to make such labor comfortable, the task would be not only impracticable but impossible. It is well for civilization that there are so many that accept the discomforts of their occupation with a complacent in place of a choleric spirit. In fact, what constitutes our idea of the truly uncomfortable labors of life often depends largely upon our early training and what we have become accustomed to do, as is demonstrated by the following:

A born sailor would never feel comfortable as a Pullman porter, and he that rides over the land in palace cars would not be at ease in the rigging of a rolling vessel.

An actor would not feel comfortable doing the work of a lighthouse keeper, and he of solitude and reserve would greatly dislike facing an audience.

A minister would not feel comfortable were he compelled to accept a policeman's position, and the officer would not like it were he confined to close study and clerical labors.

A clerk in a dry goods store would feel very uncomfortable were he obliged to change places with an ore shoveler, no matter what time might be given him to develop his muscles. A tailor would be uncomfortable as a butcher, and he of cleaver and knife would prefer many other occupations to making clothes.

A business man forced to accept common labor would be as uncomfortable in his change as a common laborer having no higher abilities would, were he called upon to perform labor calling for more brain and responsibilities. In truth, either one would be so uncomfortable in the other's position as to often wish himself dead.

Only Trouble in Combating the Disagreeable.

Another difficulty lies in so many being unable to secure labor in lines best suited to their abilities. These could never find any comfort in their labor, no matter what was done to lighten its burdens. All of the above conditions force us to concede that the wages necessary to make an article or to perform labor under comfortable conditions cannot be accepted as the rule to fix the price.

In further consideration of this subject we have first to acknowledge that while all callings have more or less disagreeable and uncomfortable features, some are worse than others, and if we began to repel the most disagreeable, such action would at once start contentions as to why more disagreeable work should be imposed upon one than another. In fact, the question can be asked, what right have we to inflict more uncomfortable labor on one than on another? Is not Mr. Gompers proposition one that would open a way for demands that could never be granted? A close analysis of the condition of different callings in which labor is engaged will reveal the fact that there is no work that man performs in assisting to carry

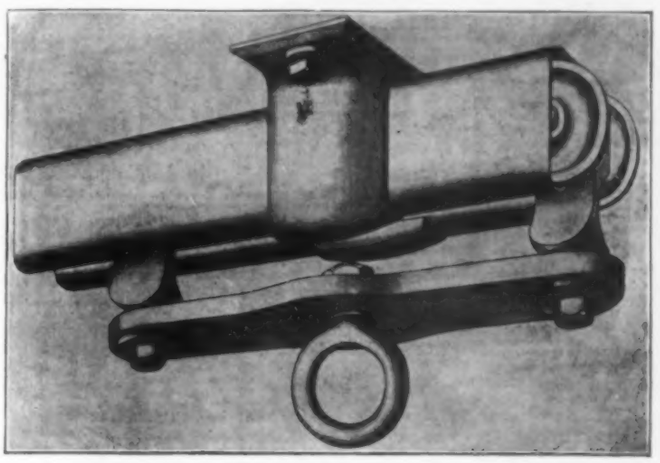


FIG. 4.—ANOTHER TYPE OF CARRIER FOR OVERHEAD TRACK.

on civilization that is not uncomfortable to a greater or less degree and also that most every person believes and often openly asserts that his calling involves much discomfort. And is it not well that this is so, for were it different those who really do the most uncomfortable labor, not hearing complaints from others, would soon believe they were carrying all the disagreeable burdens and contention would ensue to such an extent that we would find few, if any, to carry on the truly uncomfortable labors of life.

Mr. Gompers' own trade, cigar making, easy and comfortable as some may think in comparison with the work of the locomotive engineer, brakeman, sailor, soldier, puddler, miner, fireman, has its workers that can tell you of uncomfortable or disagreeable things that are impossible of remedying, and would lead some to think that most any other calling would be preferable to it. Even those engaged in clerical labor, who have from the physical laborer's point of view, the most comfortable situation in life, can recite uncomfortable conditions impossible of remedy.

Ability and Skill are the Test.

It is true that some of the discomforts linked with any class of labor that can be suggested have been decreased and some are possible of further reduction; but the question arises, where are we to draw the line in refusing to do the uncomfortable work that must be done, and what wage rate should we have to compensate us for our endurance of discomfort in comparison with what others think they endure?

This brings us again to the question at issue and we ask if the proposition that the wages necessary to make the article under comfortable conditions should fix the price of the article, and not the price the wages, is logical, or is it to labor's own interest, saying nothing about capital?

Could such a mandate be made to prevail throughout the world? By such a ruling the question of just compensation for ability, skill and experience would be wholly ignored, or at least accorded second place. All incentive to use brains, and to get skill and experience, the very qualities needed by man to invent and construct those things which would further decrease the discomfort of nearly all labor, would be discouraged and often annulled to give way in wage compensation to what might be conceded as most uncomfortable or disagreeable. The man digging a deep sewer who only requires sufficient brains, skill and experience to shovel sand and mud would be placed ahead in a wage rate of the carpenter, brick mason, plumber, painter, structural iron worker, molder, blacksmith, as we believe all engaged in the latter trades, if they honestly express their views, will concede that their labor is more comfortable or less disagreeable than the sewer digger's.

When we stop seriously to consider what it would mean to give those engaged steadily in the most disagreeable and uncomfortable menial employment preference over brains, skill and experience, we come to see not only the impractibility but the undesirability of establishing Mr. Gompers' mandate. It is best that we strive to maintain the natural laws of supply and demand in connection with brains, skill and experience as being paramount to all else in fixing the wage rate.

The Question of Comfort Settles Itself.

The question of comfort in labor more and more takes care of itself, as employers have come to learn that the more comfortable they can make conditions for their emploves, the better service is rendered, with less difficulty in holding those of the greatest brains, skill and experience in their employ. In fact, some employers have exceeded the desires and tastes of certain employes in making the conditions and surroundings of labor more comfortable. Take, for instance, the many firms that have fitted up clean, airy and commodious quarters for their employes in which to wash and change their clothes. For all this, employes have been known to ridicule such comforts and considerations and go so far as to show their disdain by leaving refuse to defile apartments which others could not enter. When we get right down to the root of the matter we find in too many cases that workingmen's ideas do not lie in their making the surroundings of labor as clean and comfortable as possible, but more in "killing time" or the opportunitv to be careless and make a playhouse of a workshop, a place where they can be tolerated to do one hour's work for eight or ten, if such best pleases their fancy. Even in this attitude of men there is not the comfort that many would think it possessed, as there are those who can sav if they will be candid that they feel better when quitting time comes, if they have done an honest day's work, one in which they have been worthy of their hire, than if they had frittered away their whole day in laboring to please fancy's whims, indifferent to the quality and quantity of their production.

The employe that has not the feeling of having done an honest day's labor is a detriment to his home, his community and his country; indeed, he approximates the drone in the hive that would live on the labor of others.

The nation highest in all that gives the greatest luxuries to workingmen is the one whose civilians are trained to perform cheerfully uncomfortable labor. Where are we to find any country to excel Americans in this respect? Remove the spirit that disregards comfort in labor and we would soon drift back to a position no higher than the lowest.

While it is true that there is discomfort in all callings, even in idleness and the life of the drone or tramp, he is best off who accepts his lot to labor with a cheerful spirit. And the workman who goes at his work on the basis that he is a man endowed with brains to use muscle and energv to the best interests of himself and mankind, without the applause of the gallerv, honestly earns his compensation for enduring the discomforts in his chosen labor, which brains, skill and experience justly dictate, and supply and demand generally regulate.

The Largest Turbine.

One of the three 8,000-h. p. Westinghouse-Parsons steam turbines which are being built by the Westinghouse Electric & Mfg. Co., at East Pittsburg, Pa., for the New York & Long Island railroad, was tested at the Westinghouse works on Saturday, Sept. 3, in the presence of a large number of engineers. The test was conducted without a hitch, the machine being operated at its full capacity of 5,500 kilowatt or 8,000 horsepower, running 750 revolutions per minute. Including the generator, the dimensions of the turbine are: Maximum length, 47 ft. 3½ in.; width, 15 ft. 8 in.; height, 14 ft.; total weight, exclusive of generator, 350,000 lb.; weight of revolving element, 47,600 lb. It is of the regular Westinghouse-Parsons construction and is the largest ever built.

Bids will soon be invited by the navy department for 10,000 tons of armor plate for the three war ships authorized at the last session of Congress. The New Hampshire is a 16,000-ton first-class battleship, and the North Carolina and Montana first-class armored cruisers of 14,500 each. It is expected that the bidders will be the Midvale Steel Co., the Carnegie Steel Co. and the Bethlehem Steel Co. The Midvale company has not yet submitted to the Government any armor plate for a test, but it is believed by the navy department that the company will be able to carry out the contract made some months ago. Experts in the ordnance bureau are anxious to test one of the Midvale plates to satisfy themselves regarding the process employed and the quality of the product.

The Gibbes Machinery Co., Columbia, S. C., has secured the contract for installing the plant of the Savannah Excelsior Co., Savannah, Ga., a new enterprise of $25,000 capital to be established in that city immediately.

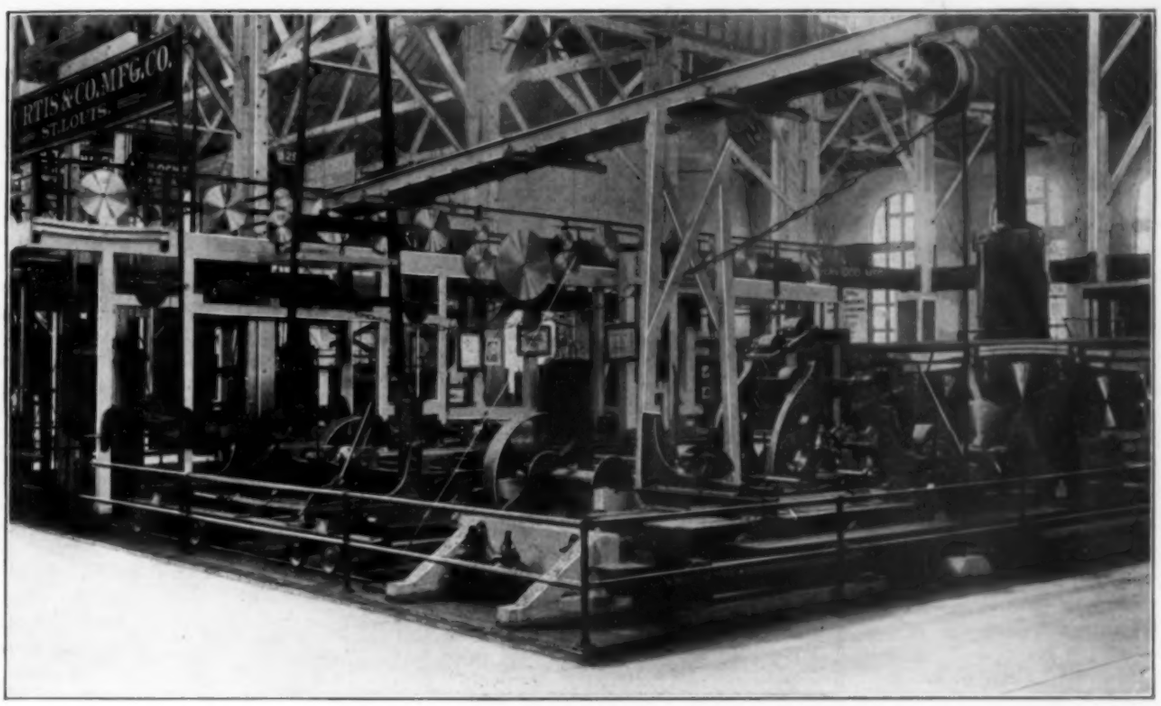
The Virginia Foundry & Machine Co., Virginia, Minn., successor to the Virginia Iron Works, has taken formal possession of the plant. A. C. Osborne, formerly of West Duluth and more recently of Eveleth, will assume the business management of the concern.

A VARIED MACHINERY EXHIBIT.

The exhibit of Curtis & Co. Mfg. Co. of St. Louis at the World's Fair is located in Section 30, Machinery Hall, and is itself composed of three practically distinct exhibits. First is that of saw mill machinery, in which are shown various sizes and styles of mills—steam feed, with friction set works, rope feed mills and a variable feed friction mill. Besides these are edgers, trimmers, slab slashers, jump saws, swing cut-off saws, shingle machines, shingle packers, lath machinery and bolters, as well as slab conveyors and fire trough. The firm shows a steam feed mill in actual operation, this being driven by compressed air supplied from the company's air compressor exhibit. A small variable friction feed mill is shown in operation as well as some steam jump saws. The steam feed is the most recent method of driving the saw mill carriage.

In the saw exhibit is a great variety of solid tooth circular saws, cross cut, rip, shingle, lath, etc., and also a large assortment of long cross cut, drag, ice and hollow back saws. The circular saw exhibit contains from the smallest to the largest size saws. Besides these are exhibited inserted tooth saws and edger saws.

Some idea of the extensive character of the exhibit in Machinery Hall is indicated by the halftone, but the company has other exhibits on the grounds. It has installed a small traveling crane, a cupola elevator and some air hoists in the foundry building, erected by the Mines and Metallurgy Department, and has two ice cranes in actual service on exhibition at the World's Fair ice plant.



CURTIS & CO. MFG. CO.'S EXHIBIT AT ST. LOUIS.

The air compressor and pneumatic machinery exhibit contains two motor-driven air compressors in operation, from which is derived the air for operating various pneumatic machines. The exhibit has at work three Curtis pneumatic traveling cranes, varying in capacity from 800 to 20,000 lb.

There is also shown one freight elevator with direct hoist of 2,500-lb. capacity, and one rope elevator with 2,000-lb. capacity. These elevators, together with dumb waiters and package lifts and a great number of hoists, are shown in operation. The principal features of the air hoists are the balanced valve and the all-steel construction, which does away with side rods. With the patent balanced valve the operator is able to hoist or lower a load with the same accuracy as can be accomplished with a hydraulic lift, and can hold the load stationary at any point.

A valuable feature of the elevators is a cushion device, by which the elevators are brought to rest gradually and without any shock or jar. This cushion is secured entirely in the valve box, a new device, on which patents are now pending.

Western Rates on Wire.

The Union Pacific railroad has announced that its rate of 45 cents per 100 pounds on wire and nails will be withdrawn Sept. 10, and after that date the normal rate of 77 cents will be maintained. Because of this statement all of the other roads except the Missouri Pacific filed tariffs showing a rate of 45 cents on wire and nails from Chicago to Colorado common points from Sept. 4 to Sept. 10, and after the latter date the normal rate of 77 cents. The Missouri Pacific declared that it would not withdraw the cut rates on wire and nails, and an official of that company said:

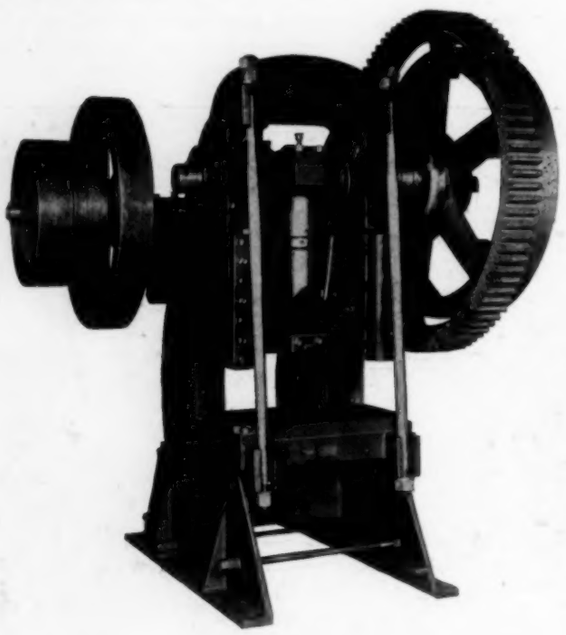
"The Union Pacific made a contract with the American Steel & Wire Co. to carry several hundred car loads of its products from Chicago to Colorado common points at a rate of 45 cents per 100 pounds. Having secured all the business in sight by making that contract, the Union Pacific wants to withdraw its cut rates as soon as it has moved that particular lot of freight. When a demand comes for wire and nails in trans-Missouri territory the country will be stocked with the stuff shipped by the American Steel & Wire Co. from here to Colorado at the rate of 45 cents, or 5 cents less than the normal rate from Missouri river points to Colorado common points. Unless it is able to get corresponding rates when the demand for wire and nails comes in trans-Missouri territory, the Colorado Fuel & Iron Co. cannot meet the competition of the American Steel & Wire Co. Therefore the Missouri Pacific and allied lines will not withdraw the reduced rates on Sept. 10, but will maintain them indefinitely."

The Mahle Boring Machine Co., Corry, Pa., with a capital stock of $250,000, has been placed in the hands of a receiver. C. W. Wason, a creditor to the amount of about $25,000, petitioned the court on the ground that the concern had lost money for 18 years.

TRIMMING PRESS WITH STAY BOLTS.

The E. W. Bliss Co., of Brooklyn, N. Y., has recently designed and built a very heavy open-back, overhanging trimming press strengthened with stay rods. These rods are held with special lugs cast on the body. This construction greatly lessens the chance of stripping the threads off the rods. The common practice is to drill a hole for each stay rod, the rod being secured only by a thread in the bed as no nut is employed under the table.

It will be seen that the large gear has a pulley rim bolted to the side and the press can be run at a high speed by belt connection at that point whenever the increased rapidity of the gear is advisable for any cause. The crankshaft is made of forged steel and of very large diameter, the frame and other parts of the press being correspondingly heavy. The gears and pinions have cut teeth and the machine runs smoothly and practically noiseless. The ratio of gearing is six to one. The distance between the uprights is 20 in. and the die space 14 in. The flywheel is 45 in. diameter and 6 in. face. The



A NEW POWER PRESS.

total floor space is 75 in. right to left of machine and 83 in. front to back.

Northern Engineering Works, Detroit, Mich., write as regards crane business as follows: "From our observations, we have noticed a steady improvement in conditions during the last three months over that of the previous period of the same duration. While the volume of business booked has not been much, a decided improvement is noticed in the number of inquiries received, and the general tendency is toward a revival of interest in the purchase of new equipment. We look for a gradual increase in the volume of orders placed within the last four months of this year, but with very little change in prices before Jan. 1. Altogether indications are decidedly favorable for a better market in the near future. Among orders we have recently received we mention the following: Canadian Westinghouse Co.; Western Electric Co., Chicago; Ft. Pitt Bridge Works, Cannonsburg, Miss.; Murray Co., Dallas, Texas; Colonial Sugar Co., Bethlehem Foundry & Machine Co., Bethlehem, Pa.; Public Service Corporation, New Jersey; and the Cape Cruz Construction Co., Cuba."

The Murray Iron Works Co., Burlington, Ia., reports that inquiries for boilers and engines are very satisfactory and that it looks for a busy winter and fall. Its business in Corliss engines last month was fully equal to that for the corresponding period of 1903, while its boiler trade is ahead of previous years.

FLUORSPAR DEPOSITS OF SOUTHERN ILLINOIS.

"The Fluorspar Deposits of Southern Illinois" is the subject of a paper by H. Foster Bain, of the United States Geological Survey, contained in the bulletin entitled "Contributions to Economic Geology, 1903," recently published by the survey. The fluorspar mines described by Mr. Bain are in Pope and Hardin counties, in the extreme southern portion of Illinois. The principal mines are near Rosiclare, Elizabethtown and Cave in Rock, small towns on the Ohio river, in Hardin county. An important group of prospects is located in the northwestern part of Hardin county and the northeastern part of Pope county, and there are minor occurrences at various other points in these counties, as well as in Saline and Johnson counties.

The Illinois mines were first developed in 1842, and were for many years worked intermittently for lead. At a later period the dumps which had accumulated in the course of lead mining were reworked for flourspar, and still more recently mining has been directed mainly to the production of this mineral. For many years the Rosiclare mine was almost the only producer, the Empire, Fairview and others being idle much of the time. The rise of the price of zinc in 1899 attracted attention to the district, since zinc ores occur sparingly in it. A great deal of prospecting has been carried on in the hope of finding bodies of ores of that metal. The general failure to find important deposits of zinc ore on the north side of the river has directed renewed attention to the fluorspar, and a determined effort is now being made to enlarge the market for this product.

The Kentucky-Illinois district is not only the main American source of fluorspar, but is the only one from which it reaches the general market. Since 1882 the district has produced 218,135 tons of spar, of a total value of $1,309,469. The spar is shipped in part by the Illinois Central railway and in part on the Ohio river. At Pittsburg the American spar comes into competition with English and German material imported through New York. The American mines supply the Western trade and about half of the Pittsburg demand. The importers control the Eastern trade and determine prices at Pittsburg.

There are three main uses for fluorspar. The highest grade, containing less than 1 percent of silica, and white in color, is sold, either ground or in lump, for use in the enameling, chemical and glass trades. It brings the highest price, from $8 to $10 a ton unground and $11.50 to $13.50 ground. The second grade of spar is used in steel making, and is sold unground as lump or gravel. It is demanded for open-hearth work because of the great fluidity which it gives the slag. At present about 20,000 tons are used annually in this work, at a cost to the user of from $6 to $8 a ton. The lowest grade of spar, including all running over 4 percent silica, or spar mixed with calcite, can be used in foundry work, and while the price is and always must be low, there is possible an almost unlimited market.

It appears therefore that the fluorspar mines of the Kentucky-Illinois district will have for many years an important and growing market to supply. Their only competitors are the importers, and competition with them is mainly a matter of transportation costs.

Recent Economies in Steel Works.

A Pittsburg letter to the Philadelphia News Bureau quotes a Carnegie Steel Co. officer as follows on the effect of economies in production that have been introduced in the past year of slack demand in iron and steel:

"For two years after the organization of the United States Steel Corporation the consumptive demand of the country was so great that it exceeded the capacity of the country, and large imports were necessary. During these two years, however, and since, the corporation was expending millions of cash in introducing new machinery, cheapening costs and perfecting mill practice. Some of the machinery introduced into the various Carnegie plants enabled workmen to turn out three times the tonnage as under the old system. As a consequence, the tonnage men were enabled to make enormous wages. They derived practically all the advantage of the introduction of the new machinery. Conditions were such that

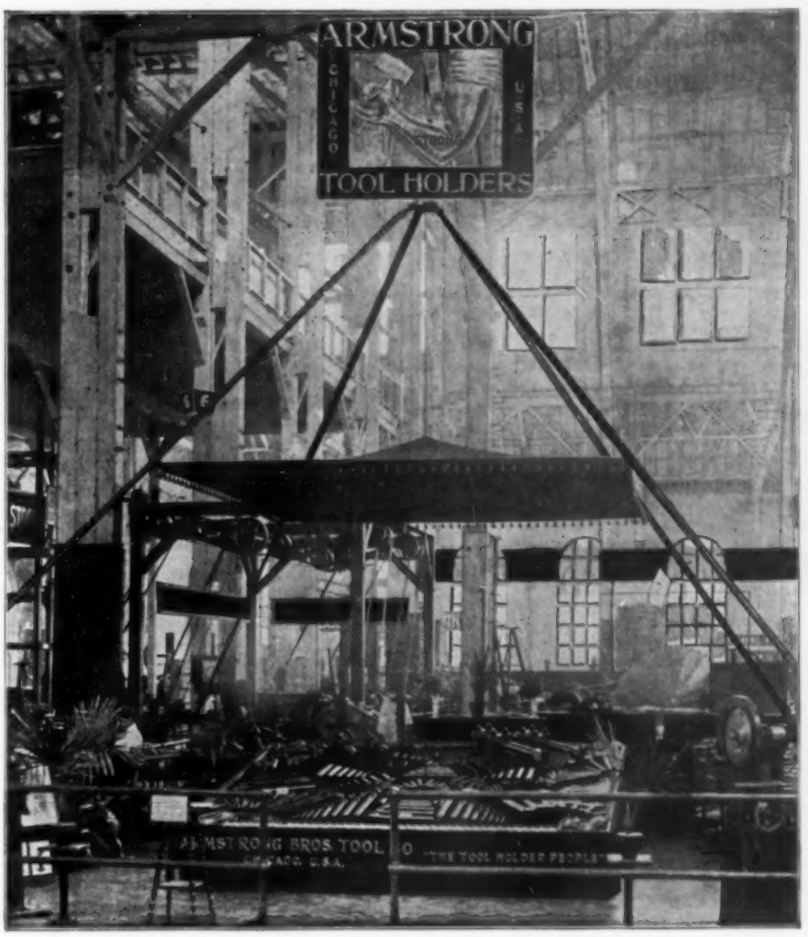
we could not enter into a controversy with our chief tonnage men and skilled workmen. What we were after was material to supply the demand that was pressing upon us.

"In the lull of the past nine months we have been able to make the readjustment of men and wages. In some departments there has been a reduction in costs of 50 percent. Of course I do not mean to say that total costs have been reduced to that extent. I can explain it better by taking a concrete example. We have in some of our departments tonnage men who made from $2,000 to $2,500 a year prior to 1900. During the first half of 1903 these same men were making from $4,000 to $5,000 a year, because the machinery and methods we had introduced enable the men to increase the output without any increase in time or assistants. We could not force these men to accept a reduction per ton at that time, because we could not afford to run the risk of a strike or an interruption to the output of the mill in which they worked. We were straining every nerve to increase the output and fill orders.

"This year, however, during the shut-down of these departments there was a readjustment of tonnage costs. The men will still be able to make the wages prior to the introduction of labor-saving machinery, but the corporation will now reap the profits of its investments in the labor-saving devices. I can confidently assert that during this summer when the capacity of plants was running one-half and even less than full, the cost of production per ton was as low as the lowest under the old Carnegie independent management when everything was being rushed to full capacity. Any manufacturer will tell you the difference in costs running one-third or one-half capacity and running full. This difference is often great enough to represent the difference between manufacturing at a fair profit and manufacturing at a dead loss. It was the policy of the old Carnegie management to take advantage of periods of dullness to increase the efficiency of the plant as a whole. This policy has been pushed this past spring and summer. An immense amount of money has been expended along this line, and it will count when tonnage increases to a normal volume."

THE ARMSTRONG TOOLHOLDER EXHIBIT.

The Armstrong Bros. Tool Co., of Chicago, has an exhibit at Block 12 in the Palace of Machinery at the World's Fair in St. Louis. It comprises a complete line of toolholders using inserted cutters for all operations on the lathe, planer, shaper and slotting machine, universal ratchets, planer jacks, clamp dogs and drill holders, also a complete line of lathe tool cabinets. The Armstrong cutting-off and grinding machine especially designed for cutting off and grinding selfhardening steel cutters for use in Armstrong toolholders attracts much attention as a unique metal working machine. It was described in detail in *The Iron Trade Review* of April 30, 1903. The Armstrong toolholder was placed on the market in 1890 and has done much to remedy the inconvenience and waste of forged tools. With the increasing recognition of the fact that it is possible to attain speeds and feeds previously unknown by means of tools made from the most modern steels has come a large increase in the percentage of waste in forged tools. The selfhardening steel is more expensive, weight for weight of tool and the stub end, as the tool grows too short for further dressing and sharpening, represents a great deal more money than formerly. There is also trouble with the blacksmith before the "dead" end of the forged tool is reached. The Armstrong toolholder system implies cutters of stock sizes and shapes, which are readily obtainable in the bar. The firm manufactures toolholders for turning, boring, planing, slotting, threading, cutting off and drilling, with over one hundred modifications of shape and size, all embodying the same fundamental idea of an inserted cutter in a permanent supporting shank or holder. The regular lathe toolholder, for example, is made in three shapes (straight shank, right hand offset and left hand offset) and eleven sizes, thirty-three different tools in all, weighing from 7 oz. to 4½ lb. each, and carrying cutters from 3-16 in. to 1⅛ in. square, suitable for any class of work, from the lightest to the heaviest.

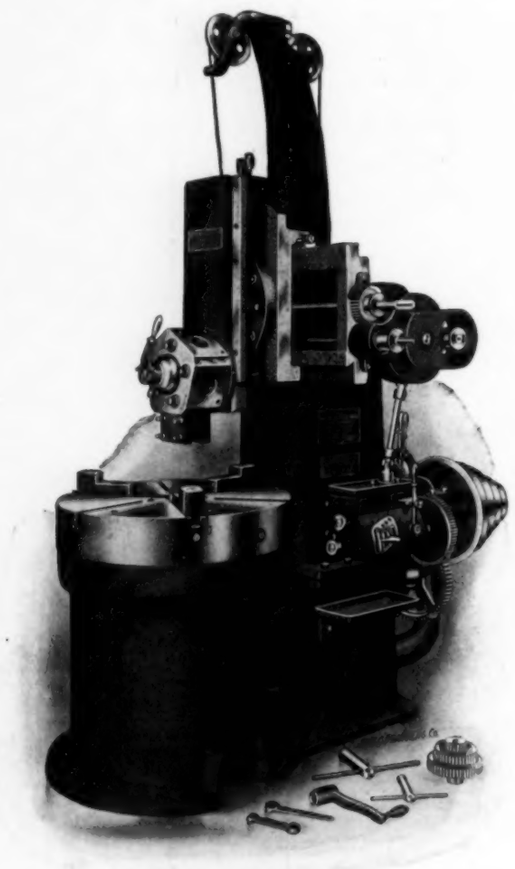


THE WORLD'S FAIR EXHIBIT OF THE ARMSTRONG BROS. TOOL CO.

BORING MILL WITH SWIVEL TURRET HEAD.

This machine swings 32 in. in diameter and 15½ in. under the crossrail. The mill is furnished with a 3-jaw combined independent and universal chuck, but can be fitted with plain table, with or without jaws. The diameter of chuck is 30 in. The chuck or face plate has eight changes of speed, from 73 r. p. m. to 18 r. p. m. without back gears, and from 9.3 r. p. m. to 2.28 r. p. m. with back gears. The height of face plate or chuck to floor is 2 ft. 9⅛ in. The chuck is bolted to a large driving gear which has an outer bearing, with automatic oiling device arranged in the bed so as to keep this outer bearing well lubricated. The center spindle, which is 7 in. in diameter and 18 in. in length, is made with angular bearing to receive the side strains with check nuts—on the underside of the spindle—to act as a precaution against any lifting tendency.

The turret slide has a traverse of 16 in., and in the swivel head can be set over at any angle up to 30 degrees, and will



NEW BORING MILL OF THE BAUSH MACHINE TOOL CO.

face 30 in. in diameter. The mill has arranged on its upright the Hendey-Norton change gear device for feeding and thread cutting and will cut 6, 7, 8, 9, 10, 12, 14, 16, 18 and 20 threads to the inch.

The vertical feeds have twenty changes, from .0125 to .1666 per revolution of the table. The horizontal feeds have twenty changes, from .015 to .211 per revolution of the table.

The machine is driven by a cone of large diameter, having a 3-inch belt, and is so arranged that it can be made with a motor drive at any time. The back gears can be changed by means of a lever, without the use of a locknut. The turret has five sides, 10 in. across the flats, and has five 2 3-16-in. holes, unless otherwise specified. The countershaft has a four-step cone with tight and loose pulleys, making 200 r. p. m.

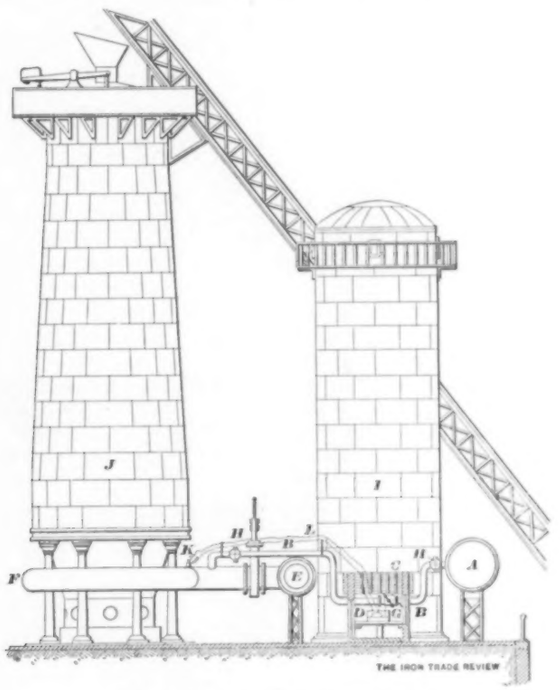
The machine is self contained and therefore does not require an expensive foundation. The floor space required is 6 ft. 9 in. x 4 ft. and the net weight of the machine 5,900 lb.

This mill is manufactured by the Baush Machine Tool Co., of Springfield, Mass.

HOT BLAST REGULATION.

John L. Stevenson describes in the *Coal and Iron Trades Review* an apparatus which shall go beyond the functions of self-registering or recording pyrometers at blast furnaces and actually regulate the heat of the blast. Mr. Stevenson says that, while the indication of the temperature of the blast at any minute of the 24 hours is valuable, the pyrometer should be so contrived that it will raise or lower the heat as required when any change takes place, and be so self-acting that it will check any variation in the temperature.

In the illustration A is the cold blast main, B the cold blast pipe. The pyrometer D is located in a house or cabin C. This pyrometer is connected by a rod to the lever of a throttle valve G, placed in the cold blast pipe B, which is intended to supply cold air to the hot blast in the circular main F. A porcelain couple is inserted in the circular main at K, and is connected by the wires L to the pyrometer D. It necessarily follows when the instrument has been set, that when the heat rises, through, say, the turning on of a fresh stove, the pyrometer will act immediately upon the throttle valve, which it will open, letting pass a certain quantity of air which will act upon the porcelain couple and cause the pyrometer to work



A SYSTEM OF HOT BLAST REGULATION.

in an inverse direction, reducing the quantity of cold air; so that the instrument is continually in action, not only registering the state of the blast, but maintaining it at an even temperature. The pyrometer house may be placed in any convenient and suitable position, where the cold blast pipe can pass through it, and not necessarily in the position shown on drawing. The house should be as free from vibration as possible, and the pyrometer kept clean from dust.

Under the profit sharing plan of the United States Steel Corporation it was proposed to pay all employes buying preferred stock of the company a cash bonus in addition to the regular dividend which they have received on the stock. This bonus was to have been 1 percent if the earnings should turn out to be at least $80,000,000 and not more than $90,000,000, 2 percent if they should not exceed $100,000,000, and so on to the top figures possible. This year the earnings of the first half of the year have not aggregated $30,000,000, so that the earnings for the year will not permit the payment of the lowest percentage. This only means there will be a lapse in the plan and that it will be taken up again as soon as the earnings permit.

The remaining idle departments of the American Ax & Tool Co., Glassport, Pa., were placed in operation this week.

FUTURE OF BRITISH PIG IRON PRODUCTION.

The pig iron industry, as such, has not had a great deal to say for itself in the report of the tariff commission, recently issued, despite the fact that pig iron averages rather more than a fourth of our total iron exports, and is a not inconsiderable, and may in the near future become an increasing part of our imports. This reticence is not altogether satisfactory. There is much that could be said, and, in our opinion, should be said, as to the primary products of the iron trade in any adequate consideration of this great question. Pig iron is the basis of all other branches of the trade. If we can produce cheap and unlimited quantities of pig iron, any defect in our progress as an iron-making country should be readily remediable. If, on the contrary, our chances of making either cheap or ample supplies of pig iron are involved in uncertainty, or are directly negatived by the facts, then it is to be presumed that we have a race before us that we can hardly expect to win.

The opinion appears to have been gathering volume and strength, both at home and abroad, that we have reached the limits of our possibilities as a pig iron producing country. Is this really the fact, or is it an invention of the enemy? It has had the support of various members of the trade who have some claims to speak with authority. Mr. Andrew Carnegie has again and again declared that the future of Britain as an iron-producing country was not of much account, and that there was no chance of an expansion of its pig iron output. In his address at St. Andrew's University, he stated that "in twenty to twenty-five years the supply of Cleveland ironstone will be practically exhausted at the present rate of production," and that "the Cumberland supply is already nearly exhausted." We need not say that many equally notable authorities would disagree with both statements—the more so that no one knows, or can possibly know, what supplies are as yet unworked in the Cleveland hills, between Middlesbrough on the one hand and Thirsk and Whitby on the other, nor can any one say at what relative cost this stone can be smelted in even so short a time as twenty-five years. The same remark is equally applicable to the iron ores of the Cumberland region. Those ores are found in pockets, and not in regularly stratified deposits, and it would be absurd to maintain that over so wide a region as that which has already been proved to contain West Coast hemitites, explorations have been made on a sufficiently large scale to determine what quantity of ore is still unworked.

Some authorities are of opinion that there may be as much ore left in this region as the quantity hitherto worked, and that quantity cannot be much, if anything, under 70 million tons. The ores of Derbyshire, Notts, Lincolnshire, Scotland, North Staffordshire, etc., are still being worked at the rate of nearly seven million tons a year, and no one is in a position to say, speaking generally, that there is not still enough ore left to keep up that rate of output for many years. But the greatest strength of the British iron industry, in the long run, is likely to lie in her exceptionally favorable geographical position for receiving the cheap ores of other countries, and we know of no good reason why, fed on such ores alone if need be, our iron trade should not be found capable of almost indefinite expansion.

In 1899, Dr. William Jacks, of Glasgow, in a communication to the press, stated that "we seem to have reached the maximum of our producing capacity in pig iron," that "we have not the materials to feed any more furnaces," and that "instead of being chagrined with the falling off in our exports of pig iron, we ought to be considering whether we should not cease exporting crude iron altogether." This is almost the gospel of despair, and we cannot understand why it should ever have been preached by so generally hopeful and sanguine an authority. If the trade as a whole were to subscribe to these views, our iron industry might at once proceed to put up the shutters. Nor can we think that such a gloomy attitude is justified by Dr. Jacks' own notable and highly successful experience. It is probable that Dr. Jacks would point to the comparative and relative stationariness of our pig iron trade during the last twenty years as evidence in support of the statements we have quoted. But before that view could be accepted, we think it would have to be proved that every known and available source of iron ore supplies had failed, under pressure, to yield a larger volume of that material than was actually consumed, and that up-to-date plants had been hopelessly and unavoidably starved. The records of the trade do not support this view of the case.

We could quote numerous instances in which British ironmasters had failed to take advantage of opportunities to secure large supplies of foreign and colonial ores, which otherwise would have sufficed to greatly increase our pig iron output. We need only name two—the ores of Swedish-Lapland, which, after having been virtually rejected by our own ironmasters, were, a few years ago, gladly seized upon by the Germans; and the next, the ores of Newfoundland, which, after being first offered to Great Britain and declined, were afterwards utilized as the basis of an important iron industry in Nova Scotia, whence this country has since been supplied with both pig iron and steel. It is the attitude of mind created by such vaticinations as those of Mr. Carnegie and Dr. Jacks that leads to our failure to seize such opportunities, and thereby to enable our rivals to get ahead. We cannot but feel that this attitude is injurious, and should be discouraged. More confidence and more enterprise would be likely to do wonders for the British iron industry. If it fails to make progress in the near future, it will not be because iron ores are not to be had.—[Iron and Coal Trades Review, London.

Carnegie Steel Co. Furnaces Resuming.

This week the Carnegie Steel Co. blew in three additional idle stacks, making a total of thirteen idle furnaces blown in during the past two weeks by this company. No. 1 furnace at Mingo Junction, O., was blown in after an extended idleness for repairs. The stack was relined and extensive improvements were made. All of the furnaces at this plant are now in operation, the other two having been blown in last week. At South Sharon, stack No. 2, completed nearly six months ago, but never blown in, owing to the depression in the iron and steel trade, was fired. This stack is 85 x 19 feet and has four Cowper-Kennedy stoves, each 90 x 21 feet. No. 3 stack at this plant, completed several months ago, and a duplicate of No. 2, has never been operated, and will continue idle until trade conditions improve greatly. Stack No. 4 at the Ohio works of this company, Youngstown, O., which was blown in this week for the first time, was completed several months ago, and like the new South Sharon furnace, was not fired until trade conditions warranted. This stack is 90 x 23 feet and is equipped with four Cowper-Kennedy-Roberts stoves, each 118 x 21 feet.

Although the required three-fourths of the appraisement of the plant of Stillwell-Bierce and Smith-Vaile Co., Dayton, O., was not received, still the sale as made by the trustees recently has been approved by United States Judge A. C. Thompson. The property was sold at public auction to Colonel J. D. Platt, at his bid of $775,000, although the appraised value was $1,192,070. However, as all the parties to the transaction were satisfied, and because it was shown that additional expense would be necessary to readvertise it, which would hardly be justifiable, the sale was approved. Col. Platt owned a mortgage on all of the property. As a result of the sale it is understood that all of the outstanding bonds will be retired at par and the company will be reorganized.

The Panama Canal Commission, Washington, D. C., has called for bids on cast iron water pipe aggregating 4,300 tons, which will be used in the construction of the new water works system in the city of Panama. The specifications call for pipe of the standard adopted by the New England Water Works Association. Of straight pipe, 40,000 ft. of 6-in. is required; 6,100 ft. of 8-in., 1,600 ft. of 10-in., 1,500 ft. of 12-in., 53,600 ft. of 16-in. and 1,400 ft. of 20-in., of a total weight of 4,254 tons. The necessary connections aggregate 376 pieces, of a total weight of 91,855 pounds.

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades and Iron and Steel Manufacture.

PUBLISHED EVERY THURSDAY BY

THE PENTON PUBLISHING CO.

1060-1068 ROSE BUILDING, CLEVELAND, OHIO.

CHICAGO - - - - - - - 1164 Monadnock Block.
PITTSBURG - - - - - - - 429 Park Building.
NEW YORK - - - - - - - - 150 Nassau St.

Subscription, $3.00 per annum. To Foreign Countries, $4.00. Advertising Rates Furnished on Application.

The Cleveland News Co. will supply the trade with THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER.

SEPTEMBER 8, 1904

THE CORPORATION'S STEEL INGOT CAPACITY.

The improvements which the United States Steel Corporation has made at its steel works in three years have been a little more than sufficient to balance works which have been definitely abandoned. There is a difference in the treatment which would be given to partly obsolete equipment by the Steel Corporation and by independents. The former would be the more likely to abandon the site definitely and employ portions of the equipment at some other works. Accordingly, the rated capacity of the corporation's steel works at present probably represents a closer approximation to their practical potential than does a summary of all independent interests. The following comparison, compiled from the last two issues of Mr. Swank's directory, is nevertheless interesting:

STEEL INGOT CAPACITIES BUILT AND BUILDING.

Standard Bessemer:

	November, 1901.	June, 1904.	Increase.
All companies	12,938,000	13,551,000	613,000
Steel Corporation (original plants)	7,825,000	7,998,000	173,000
Steel Corporation purchases		200,000	200,000
Steel Corporation total increase			373,000

Open-Hearth.

	November, 1901.	June, 1904.	Increase.
All companies	8,289,750	11,335,100	3,045,350
Steel Corporation (original plants)	2,862,000	2,990,500	128,000
Steel Corporation purchases		650,000	650,000
Steel Corporation total increase			778,500

The principal plant abandoned was the Union works at Chicago, which contributed 325,000 tons of Bessemer ingots to the estimate in 1901. There were also abandoned two small open-hearth plants owned by the former sheet interest.

The acquisitions were the Union, Sharon, Troy and Clairton steel works, and all these, with the exception of Union, contributed to the 1901 statistics. It should be noted that all these acquisitions were made by incurring additional bond interest liabilities, and in view of the rather scant operations at these acquired works, taken as a whole, it is clear that they are not necessarily self-supporting. There is quite a difference, for instance, between the sanguine language of the circular in April, 1902, announcing the corporation's desire to issue $50,000,000 of bonds for improvements, and the use of a portion of this issue, when finally made, for the purchase of the Breaker Island plant.

As a whole, the figures will probably cause some surprise that the United States Steel Corporation has fallen so far short of keeping pace with outsiders in steel ingot capacity. Some lagging was to be expected in open-hearth capacity, but not as much as the figures develop, and none was to be expected in Bessemer.

THE CANADIAN RAIL TARIFF.

While Great Britain hesitates to take a step that amounts to a complete reversal of its tariff policy of years, Canada finds no difficulty in taking a stand that is equivalent to a square endorsement of protection. The enforcement of the duty of $7 a ton on steel rails, in view of the restarting of the rail mill at Sault Ste. Marie, is an example of pure protection of an infant industry, that has no stout chance of prolonged life. To manufacture rails from imported pig iron does not smack strongly of establishing a steel industry; and the fact that the Sault mill's contract for pig iron made in the United States extends over several years indicates an expectation that the same dependence upon foreign sources of supply is expected to be a continuing condition. Moreover, for such pig iron as is manufactured on the Canadian side of the Sault considerable quantities of ore are to be imported from Minnesota.

It is a far cry from the starting up of a mill to the successful establishment of a rail-making industry, and the purchases of rails for Canadian roads in recent months from the rail mills of the United States are proof that the great railroad interests of Canada are moved more by interest than by sentiment, and are at least in a waiting, or even skeptical, attitude toward the rail-making industry in Canada. On some of the orders now on the books of rail mills in this country there is a good chance of the new duty being assessed, as deliveries cannot be completed within the short exemption allowed on rails already under contract. If to the $7 a ton, there is added the penalty imposed under the recent anti-dumping legislation of the Dominion Government some of the rails recently bought by Canadian roads in the United States will prove exceedingly expensive, though bought considerably below the price of the rail pool.

INCREASING USE OF STEEL IN MINES.

Much as has been said about the displacement of wood by steel, the movement continues to present phases that call for comment. Now and again the question of corrosion is raised and with a seriousness that essays to challenge the rapid piling up of steel tonnage in tall buildings. But no deterring effect will be realized by these cautions—that is, so far as diminishing the tonnage of steel is concerned. The problems of safety and durability will be solved satisfactorily and the use of steel in building construction will go on increasing.

Another consideration recently urged is that the campaign of concrete is now being prosecuted with vigor, and some predictions have been made that this movement will be at the expense of steel. While it is too early to speak positively, enough is known to in-

dicate an excess of confidence in some of the sweeping predictions as to the future of concrete. Steel manufacturers are by no means ready to accept the claims that have been made for concrete in certain situations where it has appeared to come in competition with steel. Indeed some of the data already gathered would seem to suggest conservatism in the acceptance of concrete, or concrete and steel, for all the service for which it has been offered.

Following the development of the steel structure and later of the steel car—both now strong feeders of the steel industry—there is now coming on a demand for steel from the mining industry of the world. Next in order will come the steel railroad tie with possibilities far greater than is generally appreciated today. The steadily increasing cost of mine timber is the compelling influence in the case of mining companies as is the growing expensiveness of wooden ties with the railroad companies. The wasteful using up of our forests and the failure to undertake tree replacement on any adequate scale have brought about a situation that points to one outcome—a very greatly increased employment of steel in the next generation. The anthracite companies of Pennsylvania have experimented satisfactorily with steel rolled shapes to replace the heavy timbering required at the bottoms of shafts and slopes, in underground pump rooms and on wide turn-outs and in drifts. In this they are but following European practice, which has been for some time employing masonry, concrete and steel to replace timber in permanent work. European engineers are making wide use of steel in underground work. In the mines of England steel bars and wood props are a common combination, while on the Continent complete sets of steel are used. At some French collieries steel lagging is employed, having the advantage of the smaller space occupied and entailing less excavation.

In the Lake Superior copper and iron regions a good beginning has been made in the use of steel for lining mine shafts. The Pioneer and Norrie mines are examples, and the Chapin is third in the list of Steel Corporation properties to employ steel for this purpose. For shaft house construction steel has been in use in the Lake Superior region for more than a half dozen years.

Along with the advent of the steel head frame has come the use of steel for tipples. Pennsylvania set the example in the replacement of wood tipples with the steel structure, with its protection against fire and its greater durability. Now the movement is spreading westward and engineers having to do with mining erection are giving the question careful study. The first objections that steel would not be durable, exposed to powder smoke from the mine and to sulphurous gases from burning "dirt" dumps on the surface, have been taken care of by proper protective provisions. At the first also there was a failure to give the steel structure the necessary strength and rigidity, but experience has taught better practice here. Summing up the situation at the conclusion of an exhaustive paper read before the Western Society of Engineers at Chicago, George S. Rice passes this verdict:

> The steel tipple in the West has been injured by its friends. Many will say that it is a failure, but they judge from the examples they have seen, and the writer regrets to say that there are very few good steel tipples in the West. But the few that are satisfactory point the way to still better things. A good wooden tipple is far better than a poor steel one, but a really good steel tipple is immeasurably better than either and is the ideal construction. The day ought to come when the operator of a large mine will no more think of installing a wooden tipple than he would a wooden hoisting winch operated by "the American hay burning engine."

Seamless Tube Co's Plant.

(Special Telegram.)

PITTSBURG, Sept. 7.—The contract for the erection of the plant of the Seamless Tube Co. of America at Monessen, Pa., has been awarded to A. & S. Wilson. The steel work, 700 tons, was awarded to McClintic-Marshall Construction Co. The main building will be 140 x 600. Hooven, Owens & Rentschler Co., Hamilton, O., was awarded the contract for a 1,200-h. p. engine and the Westinghouse Electric & Mfg. Co. will furnish an 800-k. w. generator. The machinery for the plant was built in Germany and it is expected to arrive in New York in ten days. The plant will have a capacity of 100 tons per day, but will be laid out for a capacity of 400 tons. Kindl & Glafey are the engineers.

PERSONAL.

Chas. H. Little, manager of the Universal Drafting Machine Co., Cleveland, has returned from a three months' trip to England and Continental Europe, in which he visited the various agencies of his company.

Henry J. Eberhardt, who was for many years with Gould & Eberhardt, of Newark, N. J., Elmer G. Eberhardt, who was also with the same company for several years, and Frank E. Eberhardt, another brother, are now associated in business as Eberhardt Brothers Machine Co. The new firm will specialize in the manufacture of gearing and gear-cutting machinery at Newark, N. J.

James Duane, formerly general superintendent of furnaces for the Virginia Iron, Coal & Coke Co., has been made general manager for the Chapman Iron, Coal & Coke Co., Goshen, Va., with headquarters at the Goshen furnace. J. T. Simpson goes with him as superintendent of mines and James W. Beckham as master mechanic.

Roscoe Cornell, a graduate of the Michigan College of Mines, has been appointed manager of the new branch office of the Allis-Chalmers Co. in El Paso, Tex.

Jacques Lagercrantz, manager of the recently opened northern division of the Royal Swedish state railways, has arrived in Chicago on his way to Duluth, where he will study the ore trade and the methods employed in mining and marketing. He has been sent by the Swedish Government with a view to recommending the use of modern machinery in the mines in Norway and modern methods of transporting the ore.

Alfred Jacobson, who is in the United States on a scientific mission, as representative of the Ecole Centrale, of Paris, visited a number of iron and steel plants and public works in Pittsburg, Cleveland and Chicago in the past week. He had previously spent considerable time at the St. Louis Exposition.

F. T. F. Lovejoy, formerly of the Carnegie Steel Co., is reported to be seriously ill at Glenfield Springs, Col.

John H. Early, for many years connected with the sales department of the Cleveland Rolling Mill Co., and more recently with the operating department of the American Steel & Wire Co. in the Cleveland district, has removed to New York, taking an important position in the sales department of the company.

Stephen W. Tener, formerly assistant district manager of the American Steel & Wire Co. at Pittsburg, has removed to Cleveland, succeeding the late W. W. Herrick at the head of the pension department of the company.

On the severance of his connection with the company on Sept. 1, G. H. Gardner, president of the Iron & Steel Press Co. since its organization, was presented with a loving cup and engrossed testimonial, by members of the business and editorial staffs of the company.

The Labor Situation.

MOLDERS' STRIKE IN CINCINNATI.

About 400 union iron molders employed in Cincinnati and Newport, Ky., foundries went on a strike Sept. 6 against a reduction of 20 cents per day in wages. The proposition of the men was that they would accept the cut if a nine-hour day was conceded, or the old rates (last year's scale) to remain in effect with a ten-hour day. The shops involved are the Queen City Foundry, the Bollmann-Wilson Co., the Eureka Foundry, John Oberhelman & Co., Buckeye Foundry Co., the Erhardt & Sons Co., the I. & E. Greenwald Co., the Globe Foundry Co., Wessling Bros., Victor Knecht & Co., the Johanigman Foundry Co. and the Newport Iron & Brass Foundry Co.

The Laidlaw-Dunn-Gordon Co. has granted the nine-hour day and reduced wages 20 cents per day.

SHEET AND TIN PLATE WORKERS ASKED TO CO-OPERATE

The following notice has been posted in plants of the American Sheet & Tin Plate Co., addressed to its employes:

"For the purpose of stimulating the use of our various products of both the sheet and tin mills by developing new purposes to which they may be advantageously put, we desire the co-operation and assistance of yourself and all subordinates, including the workmen in your mills. We feel that with the assistance of this vast amount of intelligence we may reasonably expect results that will largely increase our tonnage. We would like to have it understood that anyone offering suggestions which are developed so as to increase the consumption of our products, will be properly compensated after such development shall have taken place. It will also be an opportune time to have our workmen understand that we stand by willing and ready to properly compensate them for any method or device they may suggest or design that will reduce our cost of manufacture. The hearty and earnest co-operation of all employes along the lines indicated will undoubtedly be most beneficial both to themselves and our company, and we sincerely hope the subject will appeal to them and that we may have the benefit of their careful thought and suggestion."

NATIONAL METAL TRADES ASSOCIATION.

CINCINNATI, Sept. 6.—The temporary office of the National Metal Trades Association in Chicago, which has been in charge of Secretary Robert Wuest for the past three months, has been closed.

The association maintains a special representative in Chicago for the sole purpose of providing for the men whom it sent there, securing for them such positions as they are best fitted for and otherwise looking after their interests. As an illustration of this, the secretary reports having made arrangements in the last week of his stay for the bringing to Chicago of seventeen families. The association has been able to demonstrate more clearly than ever the sincerity of its promises to look after the welfare of workingmen, securing to them freedom of employment as guaranteed by law.

All struck shops in Chicago are running full handed, and under normal conditions except for the maintenance by the machinists' union of the picket lines. The places of the strikers have been permanently filled by men who have been sent to Chicago by the association. Less than 20 of the 1,400 who went on strike have regained their positions. Many of the strikers have left Chicago, securing positions on the Santa Fe road and in other parts of the country.

The Chicago Metal Trades Association is mailing to the foremen of its members handsomely printed invitations to a foremen's meeting which will take place at the Sherman house next Friday evening.

The finance committee of the association held its regular meeting at the Cincinnati offices Saturday and was much pleased with the healthy financial condition.

The Machinists' strike at the National Elevator & Machine Works, Honesdale, Pa., is being handled by the association to the satisfaction of W. W. Wood, general manager of the concern. Men have been sent there by the association and the work of the shop is being carried on.

In all other places where the association has been handling labor matters, strikes have either been declared off or they have reached a stage where they do not interfere with the operation of the shops of the members of the association.

The reports received from the membership of the number of operatives now employed indicate a revival of business in some sections and a fair inference from such reports is that a better condition prevails all over the country in the shops of the members of the National Metal Trades Association, since no appreciable falling off in operatives is noticeable.

The commissioner, W. P. Eagan, has just returned from an extended Eastern tour in the interests of the association. He found a very marked disposition on the part of employers to co-operate with each other and a general recognition of the necessity of organization.

REPUBLIC IRON & STEEL CO. SHUT-DOWN.

All of the mills of the Republic Iron & Steel Co., Youngstown, O., were shut down last week for an indefinite period. The Bessemer steel works, as well as the finishing departments, were closed, and no reason was given for the move. It is believed, however, that the step was taken to hurry an agreement with the Amalgamated Association on the scale for the ensuing year, this scale, however, not affecting the employes of the Bessemer department. Ever since the association's convention dilatory tactics have been adopted and as yet no agreement has been reached either on the puddling or finishing scales. The mills that have operated since July 1 have been on the 1903-04 scale, and if no agreement should be reached with the association this increase in wages over the amount they are willing to pay will be a loss to the company. On the other hand, if an agreement should be reached on a lower basis, the new scale will date back to July 1. At Chicago two members of the board of conciliation to arbitrate these scales are vainly endeavoring to agree upon a third party, but after a week's effort have been unsuccessful. There is little doubt that the step taken at Youngstown will soon result in some definite action on the part of the Amalgamated Association.

LABOR NOTES.

The president of the Central Labor Union at Albuquerque, N. M., has been given a sentence of 70 days in jail, and four other striking machinists of the Atchison, Topeka & Santa Fe railway have been sentenced to 60 days each, for assault upon non-unionists and violation of an injunction granted by a local court recently restraining strikers from interfering with the new men.

Molders employed in the machine shops of the Quincy Engine Works, the Gardner Governor Works, Clement Bush, the Modern Iron Works, the Central Iron Works, the Reliable Foundry and the Quincy Foundry & Novelty Co., all of Quincy, Ill., have received notice that the employers do not wish to maintain the agreement entered into Sept. 28 of last year. According to this agreement the employes worked nine hours, with a minimum scale of $2.75 per day.

Employes of the Illinois Steel Co. employed on a tonnage basis will have their wages reduced. The exact amount has not been determined, but it is believed that an amicable arrangement with the men will be effected.

Seven hundred tinsmiths and sheet metal workers went on strike at Philadelphia Sept. 1 for an advance of 5 cents an hour. Formerly the men were paid at the rate of 37½ cents per hour.

Officers of the Pattern Makers' League of North America and the Molders' International Union are discussing plans for the amalgamation of the two bodies. The molders now have a membership of about 40,000 while the pattern makers have between 5,000 and 6,000 members. There are about 10,000 pattern makers in the United States and Canada.

The riveters employed at the McKees Rocks plant of the Pressed Steel Car Co., Pittsburg, went on a strike last week for an increase in wages to a uniform rate of $2.25 per day.

HIGH TEMPERATURE MEASUREMENTS—IV.

BY S. H. STUPAKOFF.

There are two sets of instruments known under the name of calorimeters, which differ greatly in design and purpose. One serves for the determination of the calorific value of fuels and the other for the determination of temperatures by the quantitative absorption of heat by suitable thermometric substances. Only those belonging to the last mentioned group are of immediate interest to us under our present heading. We distinguish further between three different methods of calorimetry; one by the melting of ice, a second by the evaporation of water, and a third by the immersion of heated substances in water. Of these three it is again the last one, which is founded on the measurement of the elevation of temperature of the water used as an immersing medium, that is the prevalent mode of thermometric or pyrometric calorimetry.

A calorimeter consists of a double or triple jacketed metallic or wooden vessel, which is carefully guarded against loss of heat by conduction and radiation. This vessel is partly filled with a definite quantity of water (from one to two litres), provided with a suitable cover and equipped with a small but long bulb thermometer graduated to fifths or tenths of a degree. For scientific investigations thermometers are used giving fiftieths and hundredths of a degree. Balls or cylinders of metals, mostly platinum, irons, nickel or copper, serve as thermometric substances, which are exposed to the source of heat to be measured, and then immersed into the calorimeter. The rise of temperature of the immersion liquid, which is gently stirred with the thermometer, is then carefully noted, and the initial temperature of the thermometric substance calculated by using as a factor its specific heat value. If previously by experiments the values of the total heat for different temperatures have been determined, and if these have been plotted out in a curve whose abscissæ are temperatures and whose ordinates are total heats, the latter can be easily found by tracing the point of intersection of the abscissæ indicating the value given by the experiment.

As to their precision C. R. Alder Wright says: "Accurate results may be obtained by an expert operator working in precisely the same way as that employed in the calibration of the instrument, but very considerable errors are apt to be introduced, if the instruments as sold are employed without such corrections being made, and if the times which elapse during the withdrawal of the heated ball from the blast main* and its dropping into the water are at all unequal, so that different amounts of heat are lost by atmospheric cooling before the ball reaches the water. Moreover, with use the balls become lighter, and the temperature indicated is then too low."

It should be further mentioned that it is impossible to take continuous observations with a calorimeter, and that the time necessary for each observation is about half an hour. The instrument is not recommended for laboratories, but it may be satisfactory where the importance of accurate measurements is not such as to justify the outlay for more costly apparatus. If anything is to be said in its favor, it could be no more than its low cost and ease of use.

A class of instruments, commonly known under the name of expansion pyrometers has found favor and ready sale for many years in the manufactures. Their principle is based upon the expansion of metals under exposure of heat. We find Muschenbrock as the first one cited who constructed an instrument of this kind. He was followed by Brogniart, Laplace, Lavoisier, Pouillet, Daniell, Bregnet and others, who, adhering to the same principle, gave their apparatus somewhat differing forms. Bregnet was the originator of the compound ribbon; others used a single rod or strip which acted variously upon an indicator by a hand and dial or its equivalent, and it showed in this manner the degree of heat by the expansion of the exposed metal.

All these older contrivances are gone entirely out of use. Modern expansion pyrometers are usually of a convenient shape and nominal in price, but they require frequent adjustment as their metallic expansion wires or strips suffer a permanent set when they are exposed to high temperatures. Atkinson says of the older instruments of this type in his translation of Ganot's treatise on physics: "None of them gives an exact measure of temperature;" and this is equally true of this class of instruments of recent design. As a matter of fact, they appear under an assumed name to which in justice they are not entitled, since they are lacking in constancy, the principle feature of "measuring instruments." Other authorities corroborate this statement. Among others Weinhold says in Poggendorf's Annalen that it is not possible to obtain trustworthy measurements of temperature from an instrument depending on the relative expansion of solid bodies. Any device for measuring constants of nature should give, of course, above all things constant indications, which should be no more variable than the constants of nature themselves, else it would fail in its purpose, cause errors, distrust, annoyance and an endless amount of trouble. This shortcoming may have furnished the principal reason for ignoring expansion pyrometers in all modern works on pyrometry.

*Mr. Alder Wright refers to blast furnace practice and to the Siemens copper ball calorimeter.

Gas pyrometers are delicate scientific instruments which are almost exclusively used for scientific research and for the calibration of pyrometers of other construction. They consist of a bulb sometimes made of iron, platinum or porcelain, but principally of the latter, which is filled with a gas, preferably nitrogen, and provided with a manometer to record pressure. Gas thermometers, constructed according to the same principle and used for the determination of lower temperatures are mostly made of glass. The gaseous law, or the law of Boyles and Charles establishes the fact that *"the volume of a gas is proportional to its absolute temperature."* That is, all *true* gases practically agree with each other in their expansion throughout the range of a temperature scale which commences with the absolute zero. Or, if v represents the unit of mass, p the pressure and t the temperature, the absolute zero being the ball, then the quantity $\frac{v\,p}{t}$ remains constant for the same gas, and it is nearly identical for all true gases. This property of a true gas furnishes an excellent means for the determination of temperatures which lie either way considerably beyond our fixed points of reference, and it is this principle which gives us the basis for the construction of our gas pyrometers.

Without wishing to enter in this place into the mathematical side of the subject, we wish to call attention to the conclusion which can be drawn easily from the above, viz., that the volume of the gas remaining constant, the pressure rises in the same proportion as the temperature, and again, the pressure remaining constant, the proportion of the volume to the temperature will remain the same. And accordingly, the general formula employed in the use of a gas pyrometer for constant volume is $\frac{pt - po}{p\,100 - po} = \frac{t}{100}$ and the one for constant pressure $\frac{Vt - Vo}{V\,100 - Vo} = \frac{t}{100}$

Both methods, i. e., the constant volume and the constant pressure method have been employed independently in the construction of gas pyrometers. But there are various reasons —an explanation of which lies without the scope of this paper—why the volumetric method, first used by Ed. Berquerel, is the preferable one of the two. It may be casually mentioned that this method does not require the invariability of the gaseous mass throughout the duration of tests, and that the changes of pressure resulting from a given variation of the mass give the corresponding measures of temperatures.

Of the three substances platinum, iron and porcelain, which have been used for the construction of the bulbs of gas pyrometers, it is the inside and outside glazed porcelain which has given the best satisfaction, and this material is recommended by all authorities as the most suitable one for future constructions.

Iron balls are the cheapest, but they are permeable to hydrogen, they are easily oxidized in the air and readily attacked by carbonic acid and water vapor, which more or less, are always present in the gaseous products during the process of combustion. The coefficient of expansion, which plays an important factor in this class of instruments, is quite irregular for iron, and small impurities modify its value to a considerable extent.

Platinum at red heat is quite impermeable to all gases except hydrogen. Its coefficient of expansion increases in regular steps with the increase of temperature and it is not oxidizable, but the bulbs are very expensive.

Porcelain is always more or less porous, and not only permeable to gases, but it even dissolves gases, and particularly water vapor passes through it quite readily. Glazing makes the porcelain impermeable; an internal pressure will crack the coating if glazed on the outside only, and the glazing itself usually softens above 1,000 degrees C. At this stage the glazing becomes inefficient, as it will then dissolve gases like all glass. The coefficient of expansion of porcelain varies for different temperatures between fixed narrow limits.

Numerous experiments, determinations and researches have been made with the gas pyrometer by Pouillet, Regnault, Saint-Claire-Deville and Troost, Ed. Berquerel, Mallard and LeChatelier, Carl Barus, Violle, Chappius, Callendar, and Holborn and Wien; and valuable information was received through the use of these instruments at the hands of these illustrious scientists. But the apparatus remains up to the present day of purely scientific interest. The principle on which it is constructed makes it an excellent tool for the physicist for scientific research and for the standardization of other styles of pyrometers; yet, principally on account of its bulkiness and its extremely fragile nature, not to mention the necessary calculations connected with its use, it is in all its forms and modifications altogether unsuitable for industrial purposes.

Mr. Schwab Acquires Bethlehem Steel Co.

Three hundred thousand shares of stock of the Bethlehem Steel Co., the entire capital stock of the company was sold for $7,500,000 Sept. 2 by former United States senator, James Smith Jr., receiver for the United States Shipbuilding Co., acting as special master under direction of John William N. Lanning of the United States district court. The par value of the stock is $15,000,000. The stock was bought in by William C. Lee, the only bidder, president of the Standard Trust Co., of New York, which held the stock as trustee, and the shares become subject to an agreement between Charles M. Schwab and the reorganization committee for the United States Shipbuilding Co. Mr. Lee, as soon as the stock was knocked down to him, handed Receiver Smith a check for $100,000, as required by the order of the court directing the sale of the stock under the decision in the joint forecloseure suit brought by the New York Security & Trust Co. and the Mercantile Trust Co., of New York, against the United States Shipbuilding Co. and others. Mr. Lee bought in the stock for the reorganization company of the United States Shipbuildling Co. for the benefit of the bondholders. The $7,500,000, if paid in cash, will be used to take up bonds of the United States Shipbuilding Co. or that total may be paid in the bonds of the company. The sale means that Schwab is now in control of Bethlehem Steel.

William Nelson Cromwell, counsel for the reorganization committee, said in reference to the sale: "This was the first of a series of sales to be made in accordance with the foreclosure decrees to carry out the plan of reorganization. The purchase of the Bethlehem Steel stock today was made by Mr. Lane, pursuant to an agreement between the reorganization committee and Mr. Schwab and in furtherance of the reorganization plan. The next sales will be those of the properties of the Crescent, the Moore and the Canda companies in New Jersey on the 8th inst. These will be followed by the sale of the property of the Eastern Shipbuilding Co. at New London on the 12th inst. and of the Hyde Windlass Co. and Bath Iron Works at Bath, Me., on the 19th inst. The sale of the Union Iron Works at San Francisco will be held on the 26th inst. and the concluding sale of property of the Harlan & Hollingsworth and of the good will and remaining assets of the entire property will take place the first week in October. These properties will be purchased by the reorganization committee, and in due course the various properties will be turned over to the new corporation about to be formed and the new securities issued by the reorganization committee in fulfillment of the plan of reorganization. I anticipate that all this will be consummated by the committee within sixty days."

Repairs on the three blast furnaces at the Minnequa works of the Colorado Fuel & Iron Co. are progressing rapidly and it is expected that the stacks will be blown in soon. The wire mill will soon be running at full capacity.

TRADE PUBLICATIONS.

Wilcox Mfg. Co., Aurora, Ill., manufacturer of trolley track systems and hardware specialties, has just published a catalogue describing its rolling or trolley shelf ladders. These ladders are designed for rapid and convenient use in stores and warehouses, etc., and embody many unique and patented features. Adjustable floor wheels are attached to the bottom portion of the ladder, while the upper part is fixed by means of a crescent bar attached to the top rung to a grooved steel truck in the ceiling. Special swivel fixtures are furnished for curved sections of track. The catalogue is handsomely printed on supercalendered paper and the halftone illustrations are especially effective. The front page shows a vignetted photograph of the Wilcox plant, with a dim view of Aurora in the distance.

The National Gear Wheel & Foundry Co., Allegheny, Pa., has just issued a new booklet, described as circular No. 5, on machine molded gearing and the Mertes duplex gas engine. Special attention is called to a mixture of metal to which a trade name of "Homo Iron" has been given, from which all the machine molded gears are cast. The metal is described as carrying a considerable percentage of graphitic carbon, diffused throughout the casting, giving a uniform fracture. The tensile strength of the iron varies from 30,000 to 40,000 lb., and the elongation from .5 to .9 percent. The Mertes engine is built in 60 and 100-h. p. sizes.

The little pamphlet from Wyman & Gordon, of Worcester, Mass., and Cleveland, is a departure from the series of short stories that have been an interesting reminder of the firm for several months. The present effort is as distinctive in its way as the biographical sketches of famous leaders in the mechanical world. It is entitled, "A Few Words About Electrical Matters," and has been prepared by Horace Wyman. The writer has given a concise explanation of the common units of electrical science, the volt, ohm and the watt and compares them graphically and otherwise with water power measures and the considerations attending head, flow, etc. The company has an exhibit worthy of note at Block 11, Machinery Hall, Louisiana Purchase Exposition.

A circular from the Three Rivers Tool Co., of Three Rivers, Mich., gives the sizes of Mathews' high speed steel reamers from ¼-inch up to 6 inches. This reamer has cutting edges of high speed steel united to a body of soft steel forming a solid reamer. The hand reamers have the square casehardened and the lathe reamers have a large center in the end of the shank and a flat for the dog screw, both being casehardened. The drill press reamers have taper shanks with tang casehardened. The firm also manufactures Lodge & Shipley boring bars, Chards spindle drills and special tools.

A catalogue of parts of the alternating current, 104 volts, arc lamps; a description of the multiphase, revolving field, belted generators and transformers are three pamphlets from the Fort Wayne Electric Works, of Fort Wayne, Ind. The transformer is usually of little interest to mechanics, but judging from the account here given a good reliable device has many excellencies in the way of experienced design and careful workmanship. As has been pointed out, constant potential transformers for changing the high voltage of transmission to the working voltage of lighting or motor service perform exacting duties under unfavorable conditions. "High from earth on a pole at any distance and any direction from attention, the transformer must be proof against all disturbing elements both external and internal. It must maintain a constant voltage for the use of the consumer without interruption. It must protect the consumer against high primary potentials. It must always be ready for its smallest load or its maximum overload. It must not only serve the consumer faithfully, but at the same time it is expected to comply with a set of exacting requirements dictated by its owner, the central station. It must consume a minimum amount of central station energy in transforming for the consumer. This requires small losses or high efficiency. It must maintain this high efficiency all the years of its service. This requires a magnetic circuit of unchanging permeability or nonaging iron. It must keep itself free from internal complications. This requires perfect insulation of a permanent charac-

ter. In short it must perform its functions continuously from its installation with the least possible attention from the station man and with the best possible results for the consumer."

"Instructions for the Care and Operation of Direct Current Electric Generators," such as are built by the Jeffrey Mfg. Co., of Columbus, O., is a plain recital of successful operating conditions. The instructions are brief but clear and the steps to be taken are outlined successively. Several illustrations show brush and other connections for counter and clock-wise rotation, the setting of brushes, etc.

Jenkins Bros., of New York, have a new booklet, "Valve Troubles and How to Avoid Them." The first part is a summary of the difficulties often found in valve use and installation and submits some suggestions for their remedy. The balance of the book treats of the principal types of valves manufactured by Jenkins Bros. There are numerous halftones.

The 1904 general catalogue of the Warner & Swasey Co., of Cleveland, is descriptive of machines for iron and brass work. These include horizontal boring machines, automatic boring and tapping machines, cock grinders, forming turret lathes, hollow hexagon turret lathes, double head key lathes, valve milling machines, screw machines, vertical turret machines, etc. The halftones are an exceedingly attractive feature of a well prepared and printed pamphlet and the noteworthy points of the tools are brought out with great distinctness in engravings and text. The catalogue has 59 6 x 9-inch pages showing the results of the twenty-year experience of the firm in building turret machines.

The Webster separators for steam and oil are described in part 3 of the general catalogue of Warren Webster & Co., of Camden, N. J. The separators have been on the market for sixteen years and during that time the line has been thoroughly tested for a wide range of service and the product continuously brought up to date. Much information is given about separating as well as separators and one of the uncertain factors in oil separation comes up for comment. This is the nature of the oil employed for lubricating the engine cylinders. It is recommended as highly essential that only a good lubricant be used and that but sparingly, particularly in plants where all or part of the condensed exhaust steam is returned and used as feed water for the boilers. On this point the pamphlet further states: "A light oil, which vaporizes at a temperature lower than 400 degrees Fah. (which is the temperature of steam at 235 pounds pressure), or one which contains a large quantity of compounded animal matter (which carbonizes when exposed to ordinary steam temperatures), should not be used, as the light oil vapor and carbonized animal matter are products which cannot be reconverted for separation and removal from steam by mechanical means. A volatile oil, or one that contains more than 8 per cent of animal matter, is unsuitable as a cylinder lubricant under any conditions. This percentage of animal matter should be acidless tallow." The pamphlet is profusely illustrated.

A few facts about hot water piping are given brief expression by the Model Heating Co., of Philadelphia. These relate to the pitch and capacity of pipes, hanger requirements, relation of branches to main pipe, etc.

Owing to the increase in its business in Chicago and vicinity, Cal. Hirsch & Sons Iron & Rail Co., of St. Louis, has opened branch offices at Nos. 306 and 308 Railway Exchange building, Chicago.

The Westinghouse Electric & Mfg. Co. received the contract for engines, generators, stokers and power plant machinery for the warehouses of the Pittsburg Terminal & Warehouse Co.

Eberhardt Bros.' Machine Co. is erecting a two-story brick shop at Newark, N. J.

The plant of the Sharon Steel Hoop Co., Sharon, Pa., resumed operations last week after a brief idleness.

THE AMERICAN TRIP OF BRITISH ENGINEERS.

At a general meeting of the Institution of Mechanical Engineers, in London, President J. H. Wicksteed commented on the visit to the United States. Some extracts from his address follows:

"Five short weeks spent by members of the Institution of Mechanical Engineers in the heart of North America fill the mind with delightful memories left by the cordiality of our hosts, the natural grandeur of the country, the exhilaration of the air, and the refreshing optimism of the people.

"The American Society of Mechanical Engineers, at whose invitation we crossed the Atlantic to join in their spring meeting at Chicago, and to visit the Exposition at St. Louis, had also prepared lists of 200 workshops which were opened for our inspection, and which were probably of more engineering interest even than the great exposition itself, for it is in the nature of an exhibition to show the results rather than the methods of production. Our introduction to works under the ægis of the American Society of Mechanical Engineers was therefore of the greatest advantage to us. It is hoped that in the coming session several of our visiting members will present papers for reading and discussion upon things of mechanical interest which they have observed either in the exposition, or in the workshops, during this peripatetic summer meeting.

"Mr. Ambrose Swasey, this year's president of the American Society of Mechanical Engineers, and with whom your president had the honor of sharing the chairmanship of the sessions, is one of the founders of the firm of Warner & Swasey, of Cleveland, O. The celebrated Lick and Yerkes telescopes were made, with all their machinery, by this firm. They make a good exhibit of engineers' and brass-finishers' tools in the Machinery Hall of the exposition, and of optical instruments in the Liberal Arts building. It was very congenial to your president to have such a coadjutor as President Swasey, and it is a rather striking coincidence that the presidents of the two mechanical engineering societies of Great Britain and America should both be engaged, not only in the manufacture of machine tools, but of instruments for scientific use as well.

"Many members of the American Society adjourned with us from Chicago to St. Louis, where we foregathered at the Exposition pavilion of the Royal British Commission. There Col. Watson and Mrs. Watson received a large afternoon party to meet our members, and most kindly introduced us to all the chief officials of the exposition. In the Transportation building of the exposition there is a fine historical show of locomotives, culminating in a Baltimore & Ohio locomotive, which, with its tender, weighs 230 tons. In this building there is a very large apparatus for testing locomotives. The power developed by the engine is intended to be measured both by its pull upon weighing levers and by dynamometers on the axles of the supporting wheels. In the Electricity building one maker exhibits a planing machine, which is driven by an electric motor direct upon the first-motion shaft. Of course the motor will not only have to reverse with each stroke of the table, but it will have to run much quicker back for the idle stroke than forward for the cutting stroke. A very attractive building was that of the Liberal Arts, where we were pleased to see some fine charts and sections contributed by our member of council, Mr. Mansergh. But the happiest hour spent in the exposition by your president was in a discussion with President Swasey on one of his quick-reversing lathe countershafts.

"Subsequent to the exposition we visited Cincinnati, where we had the pleasure of seeing a cylindrical milling-cutter of quick-cutting steel running at a blue heat throughout its length, milling a long slot out of a cast iron bar about 1¼ inches thick, and in no way losing its edge. Another curiosity in mechanics afterwards seen by your president was at the Worcester Technical Schools, where Professor Albert Kingsbury had made a trunk piston 6 inches in diameter, 6 inches long and weighing 60 pounds, to revolve in a cylinder with a horizontal axis without metallic contact; the trunk is supported by a thin film of air self-induced, and the coefficient of friction is only about 1-10,000. (For further particulars of this air-lubricated journal see *Journal of the American Society of Naval Engineers*, Vol. IX., No. 2, 1897.) Our interest in the convention, the exposition, and the workshops of America,

rose, as Prof. Hutton remarked, in an ascending scale, and this description held good as to our interest in the natural beauties and resources of the country and in our acquaintance with the individual men themselves who are molding its development.

"Among the engineering works to which we were invited were those of the Allis-Chalmers Co., at Milwaukee. Here there is a wholly-detached building for patterns and pattern-making, another for the foundry, another for the powerhouse, another for the machine shop, and, semi-detached from this, another for the erecting shop. This complete scheme of buildings is called by Mr. Reynolds a 'unit,' and the site of the works provides for thirteen more similar units. At these works they cast large steam cylinders upon cores armored with metal chaplets. The result is a slight amount of chill and a remarkably clean close grained surface when the cylinder is bored. These engine works, the newest and most admirable of their kind in the States, have been laid out by one of the oldest mechanical engineers in the country—namely, Mr. Reynolds—who was associated for many years with Mr. George Corliss, at the time that he was making his great name.

"The characteristics of works in the States are by no means stereotyped; for instance, Baldwin's well known locomotive works are all in one group of buildings in the center of the city of Philadelphia. When the workmen leave the gates they disperse in all directions to their dwellings. This central position in a large manufacturing city gives the works a good labor market. Two thousand men, more or less, can come and go between these works and other employment in the city with easy elasticity. The capacity of this firm is seven locomotives per diem. On the other hand, the American Locomotive Co. have eight separate branches in different parts of the country, including one in Montreal, and the capacity of this firm is also seven locomotives per diem.

"Nor are engineering designs and methods in the States confined to fixed types such as we are apt to associate with the title 'American,' and some tools of American origin, with which we are made most familiar through the columns of the engineering press, are not those which we find most largely adopted in the workshop practice of the country. Similarly, the methods of training engineers academically by no means follow identical lines. At the Massachusetts Institution of Technology a student only devotes about a quarter of the time to workshop practice which he would do at the Worcester Polytechnic. At the latter place there is a real pattern shop, foundry, machine shop, and fitting shop, where the student learns to be a skilled workman, so that they can and do turn out several types of engineers' tools which have a good reputation on the market and sell freely. But the one thing in common to all the training establishments for engineers seems to be belief in themselves and their methods and a large measure of success. Between the two extremes of methods there does not seem to be much to choose in the power of the country to assimilate the product.

"The Americans at home are far too shrewd to discard a system purely because it is old established. They stick steadily to the English foot of 12 inches, and bills in congress for the adoption of the metre do not become acts.

"We had the pleasure of a trip on a Mississippi steamer. We went 20 miles up stream and saw the junction with the mighty Missouri. This treat was given to us by the Engineers' Club of St. Louis. The steamer had side paddle wheels, with a single cylinder working through very long wooden connecting rods on to an overhung single crank on each paddle-wheel shaft. Either cylinder can be reversed separately by primitive hand-gearing. The system is old, but it is suited to the conditions of navigation in the Mississippi. In this connection it may be mentioned that the Cincinnati engineers gave us a trip down the Ohio on a stern-wheel steamer. Two horizontal cylinders drove it with very long wooden connecting rods. There were three wooden rudders between the paddle wheel and the stern of the boat.

"It is needless to say that the development of electric transport in America is huge, and consequently the works for making electrical equipment are huge also. One of the works which we were privileged to see was that of the General Electric Co. at Schenectady, interesting alike from the buildings, the equipment, and the electrical machinery produced. American cities vary from each other very greatly. For example, Washington is a city of residences and public buildings throughout; St. Louis is a city without a residential quarter, because it has absorbed its own suburbs, and so on. But all which we saw are alike in being so well served with tramways that you may go from within a block or two of any one part of the city to any other, and frequently far into the country, and even to towns and villages 20 miles away. Under these circumstances, and with cities like St. Louis doubling their population every ten years, there can be no wonder that the rolling mills and engine works of America have busy times.

"Our hearty thanks are due, and are hereby tendered, to our American cousins, whose kind attentions throughout our visit have made us feel kith and kin. The New York banquet of President and Mrs. Swasey, our reception at Chicago, headed by Captain and Mrs. Hunt, the concert given by the local reception committee at the magnificent Auditorium Theater of that city, the fraternal hospitality of the 'Engineers' Clubs' (which are a notable institution in most of the cities we visited), also the Country Club, with golf links, at Cincinnati, lunch at Deeryfield Club, Manchester, and the 'Longshore' luncheon at Shirley Point with the Boston contingent of our hosts, all made us feel welcome to the United States of America in the most agreeable manner. To say nothing of a 40 miles drive in a White's steam motor around the beautiful suburbs of Boston on the best of macadamized roads, which your president and Mrs. Wicksteed enjoyed in company with their kind hosts, Mr. and Mrs. Boyd.

"Nor was Canada behind in extending a welcome to us. The Engineers of Montreal, led by Mr. Lacey Johnson, organized visits for us to the fine new works of the Canadian Pacific Railway, the laboratories of the McGill University, and the works of the American Locomotive Co.; and the Engineers' Club, with their president, Mr. St. George, spread its hospitable board and threw open its rooms for our benefit.

"To have sailed on the Mississippi and the Ohio, Lake Ontario, and the St. Lawrence, to have stood on Mount Royal, sailed on Boston harbor and New York harbor, on Lake Champlain and Lake George, to have seen Niagara and its power stations, would all have furnished memories worth the spending of five short weeks, but to have had friendly intercourse with a nation whose language is our own, and whose kindness and cordiality seem to be modeled on the same large scale as the land in which they live, is an experience which enlarges the outlook of one's whole life. To them is given this meed of praise; and for their names they are recorded in our minutes."

Obituary.

John Brooks Yale, formerly New York agent for the Illinois Steel Co., and a son of Linus Yale, who invented the Yale lock, died at his home in Sparkill-on-the-Hudson, Aug. 29. He was born in 1845, and his business career began early and covered a variety of iron and steel enterprises in his forty years of business life. He became prominent in the Illinois Steel Co. ten years ago. Five years ago he retired from business on account of ill health.

D. L. Chestnut, assistant to the president of the Western Steel Car & Foundry Co., Chicago, died at Plymouth, Eng., Sept. 1. Mr. Chestnut was born at Paris, Ill., in 1874, and was formerly assistant treasurer of the Illinois Car & Equipment Co.

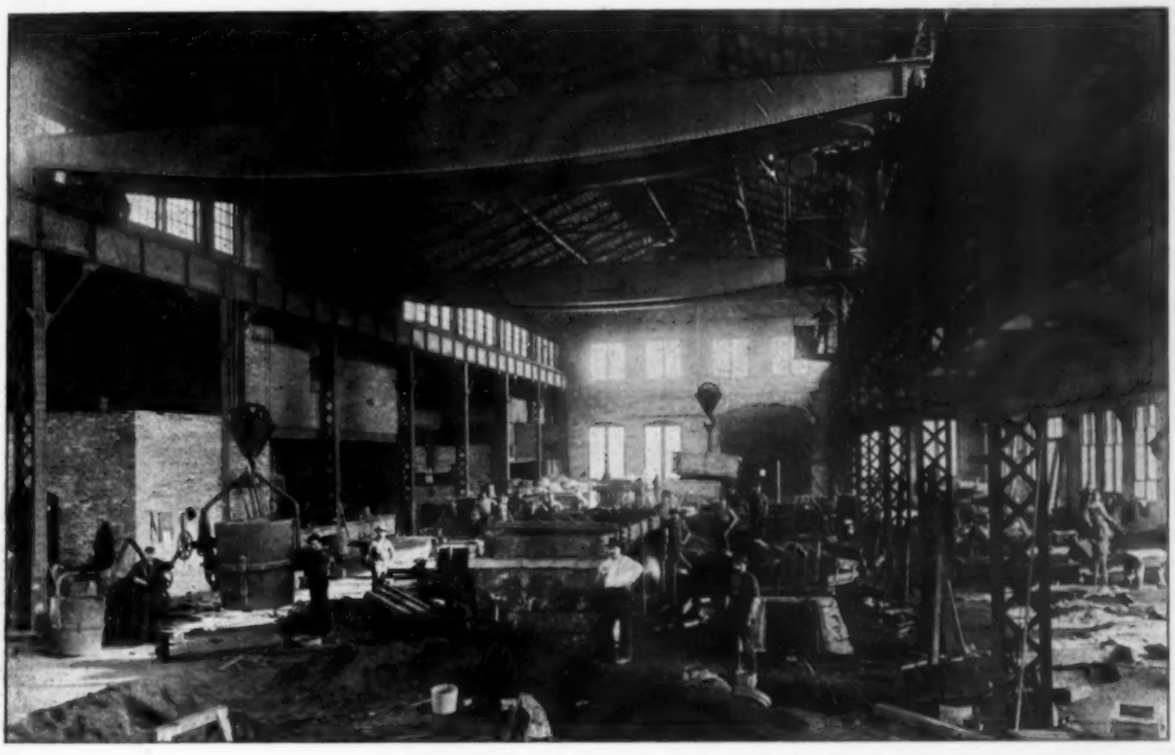
The first turbine boat ever built on the Great Lakes will be constructed at the Craig yards in Toledo for the Dunkley-Williams Co., for its Chicago-South Haven service. The only turbine boat now on the lakes was built on Newcastle-on-Tyne and was brought to fresh water this summer. She is now plying between Toronto and Hamilton. The new boat will be equipped with a Parsons turbine engine. She will have twelve boilers and will develop 5,000 h. p., enabling her with three screws to maintain a speed of 25 miles an hour. The announced contract price of the vessel is $300,000 and she is to be put in commission next June.

All of the idle departments of the South Sharon, Pa., plant of the American Steel & Wire Co. will resume operations about the middle of this month. The open-hearth plant at these works will resume operations in full about Oct. 1.

NEW FOUNDRY OF THE BATES MACHINE CO.

The Bates Machine Co., of Joliet, Ill., has recently completed and put in operation a new foundry. A general view, such as is given in the illustration, does not exhibit the various details of the equipment as clearly as could be desired, but will serve to indicate the arrangement of what is considered one of the best laid out and equipped foundries in the country. The building is 100 ft. in width by 210 ft. long. The central bay is 50 ft. span and the two side bays are each 25 ft. wide. The center bay is served by two 20-ton electric traveling cranes and the side bay, which is used for light work, has a 5-ton crane running the entire length of the building. The structure is of steel construction with brick ends and sides. The roof is of tile. A railroad track runs within fifty feet of the building on the side nearest to the cupolas and this enables the iron and coke to be delivered close to the building and facilitates the subsequent handling of the material.

As will be seen, one bay is given up to light work while the center bay is reserved for floor operations and the heavier molding. The balance of the equipment for melting, core ovens, cleaning, etc., is grouped along the one side. Down in the far corner are located the three large core ovens and each is equipped with an iron car for handling heavy cores. The space next to the large core ovens is for small cores and has one portable core oven. The next division is reserved for the brass department.



THE NEW FOUNDRY OF THE BATES MACHINE CO.

The center division with the two openings is the cupola room. This has two 72-in. cupolas. The floor above this division is of steel construction for the carrying of coke and iron and is of substantial proportions for very heavy weights. The next division on the side of the cupola room is the power house, which is provided with a motor for driving the Roots blower. This blower is located on top of the power house. The division between the power house and the end of the building is in use for casting cleaning purposes and is equipped with rattlers, grinders and chipping benches.

There is an electric elevator in the cupola room for lifting the iron and other supplies up to the charging platform. Everything in the building that can be so arranged is electrically driven, power being supplied from a generator in the machine shop.

There is a disagrement between the partners of the Seaview Tool Co., Bridgeport, Conn. The superior court has been petitioned to settle the trouble.

CANADIAN STEEL RAILS.

T. J. Drummond, a director of the Lake Superior Corporation, in discussing the imposition by the government of a duty on steel rails, is quoted as saying: "The government's action has been extremely prompt and satisfactory. It was stated in the rail duty resolution that the duty should be applied as soon as it was shown that Canadian mills could produce rails of proper quality and in substantial quantity. The Sault mill has been demonstrating that this could be done since Tuesday the 16th, and, of course, we had notified the government, and asked them to inspect the output and act accordingly. The conditions under which rails already ordered may escape the duty are quite satisfactory to us, and should, I imagine, be entirely fair to all parties concerned. It is, of course, impossible to expect anything like the full capacity of over 500 tons a day, when the mill has only just been started up, and it will take some time to get it in perfect running shape. They are already working on contract orders. The capacity of the mill can easily be raised to 1,000 tons when we get going. A considerable proportion of the ore used is Mesabi. There has been no demand for this class of ore in Canada heretofore, and consequently no development, but it does not follow that we shall always have to import. We have offers of ore properties from a number of people who claim to possess in Canada the kind of deposits that we need."

A Toronto dispatch says that a contract has been signed between the Lake Superior Corporation and the Dominion Government for 10,000 tons of steel rails for the Inter-Colonial Railway.

A representative of one of the largest steel rail mills in the United States has been quoted as follows regarding the duty of $7 a ton on steel rails for export to Canada: "The sum and substance of the matter is that the duty will prevent shipments of steel rails from this country into Canada. With a duty of $7 a ton it would hardly be worth while to solicit business in Canada. The margin of profit would be too small. It is generally known that the rails manufactured in Canada are not up to the standard in this country. If a boom in steel rails sets in at home the railroads in Canada would have a hard time securing all the rails they need. At least they would have to pay a very high price for them in order to offset the Canadian tariff." The above opinion as to the quality of Canadian rails is reinforced by Sir Thomas Shaughnessy, president of the Canadian Pacific Railway, who says: "While

it is quite proper that the Canadian manufacturer should be sufficiently protected, there is not, in my opinion, one of these in Canada who is capable of producing a rail either effectively or economically."

The new Canadian duty will not apply to contracts already made abroad, but this provision is rendered nugatory to a very large extent by the fact that imports under existing contracts must be made prior to Nov. 30, 1904, and that the tracks must be laid not later than Feb. 28, 1905. It is unlikely that anything like the full amount of rails recently bought from American mills can be delivered before Nov. 30. The Canadian Pacific has purchased 60,000 tons, and, though work has already been begun on the contracts, it is asserted that only a small portion of the order will be finished in time to escape the $7 duty.

HONORED BY LAKE SUPERIOR MINING MEN.

Otto C. Davidson, who was elected president of the Lake Superior Mining Institute at its recent meeting, is most favorably known in the Lake Superior region. He was born in Green Bay, Wis., and worked for several years in a bank in that city. In 1882 he went to the Brier Hill mine, Norway, Mich., as bookkeeper and a few months later was made superintendent of the mine, which was a small one. In 1884

O. C. DAVIDSON.

Mr. Davidson returned to Green Bay to accept a bank position. In 1886, when the Florence mine was reopened, he was made superintendent and retained that position until January, 1889, when he became superintendent of the Commonwealth mine. This property was controlled by Oglebay, Norton & Co., and he remained with them until June, 1901, in the interval being superintendent in charge of the Commonwealth and Badger mines at Commonwealth, the Aragon mine at Norway, the Bristol mine at Crystal Falls, the Beaufort at Michigamme and the Antoine Ore Co.'s mine at Iron Mountain. In June, 1901, Mr. Davidson was made general superintendent of the Oliver Iron Mining Co.'s mines on the Menominee range, which include the Chapin, Aragon and others. This position he still holds, residing at Iron Mountain, Mich. He has been president of the Commercial bank at Iron Mountain for the past three years.

The Cleveland Hardware Co. is building a new boiler house and installing Babcock & Wilcox water tube boilers of 1,600 h. p., and all modern accessories. A new chimney stack, 150 feet high, has just been finished. This company's plant was idle last week on account of taking the annual inventory, which indicated a very satisfactory year's business.

LAKE SUPERIOR MEETING, A. I. M. E.

The eighty-seventh meeting of the American Institute of Mining Engineers will be held in the iron and copper regions of Lake Superior, beginning at Duluth, Minn., on Wednesday, Sept. 14, and continuing at Houghton and Ishpeming, Mich., with an optional excursion later to St. Louis and sessions in that city. A trip to the Mesabi range will be made on Sept. 16 and 17. On Sunday night, Sept. 18, the entire party will leave Duluth by special train for Houghton, Ishpeming and Chicago, stopping two days at Houghton and one day at Ishpeming, arriving in Chicago Sept. 22. The list of papers includes the following:

"General Account of Lake Superior Geology, with Special Reference to the Districts Visited by the Institute," by Prof. C. K. Leith, Madison, Wis.; "Special Forms of Blast Furnace Charging Apparatus," by T. F. Witherbee, Durango, Mex.; "Some Requisites for Obtaining Better Results from a Modern Blast Furnace," by David Baker, Philadelphia; "Casting Machines for Pig Iron," by E. A. Uehling, New York; "Appraisal of the Value of Mineral Lands with Especial Reference to Coal Lands," by Dr. H. M. Chance, Philadelphia; "The Concentration of Gold and Silver in Iron Bottoms Reduced from Highly Ferruginous Copper Mattes, with Notes upon the Metallography of Mattes," by Myrick N. Bolles, New York; "The Investigation of Alaska's Mineral Wealth," by Alfred H. Brooks, Washington, D. C.; "Fire Brick Industry," by Weber, Ithaca, N. Y.; "Notes on the Flow of Gas from Orifices," by Prof. W. R. Crane, Lawrence, Kan.; "Centrifugal Ventilators," by R. V. Norris, Wilkesbarre, Pa.; "Report of a Committee to Co-operate in Standardizing Abbreviations, Symbols, Punctuation, etc., in Technical Papers;" "The Coals and Cokes of Peru," by J. Morgan Clements, New York.

There are also a large number of contributions in hand for presentation, in discussion of former papers, on the subjects of iron blast furnace practice, commercial specifications for various forms of iron and steel, the briquetting of minerals and fuel, the employment of electricity in mines, the metallurgy of copper, the use of concrete in mining and metallurgical engineering, etc. The discussion of topics connected with iron and steel will have special preference at Duluth, in view of the approaching October meeting of the Iron and Steel Institute in New York. In accordance with an agreement between the councils of the two institutes, all papers and discussions in this department presented at the meeting of either will be freely communicated to the other, for further discussion or republication. Contributions concerning the mining of iron ore, and the manufacture, physical qualities and equitable classification of iron and steel products, are therefore invited.

One or two supplementary sessions will be held at St. Louis, beginning on Monday afternoon, Sept. 26. Since the Lake Superior excursion ends at Chicago on the preceding Thursday, this arrangement leaves members free to spend a day or two in Chicago, or to go immediately to St. Louis, and spend their time in studying the exposition. The following papers are announced for the St. Louis sessions: "The St. Louis Exposition," by Pierre Chouteau, St. Louis; "The Department of Mines and Metallurgy of the St. Louis Exposition," by Dr. J. A. Holmes, St. Louis; "The United States Fuel-Testing Plant at the St. Louis Exposition," by E. W. Parker, Washington, D. C.; "The Lead Resources of Missouri," by Arthur Thatcher, St. Louis; "The Metallurgy of Zinc in the Joplin District," by Hermann C. Meister St. Louis; "Ore-Dressing Practice in Missouri," by O. M. Bilharz, Flat River, Mo.; "The Coal Resources of Missouri," by B. F. Bush, St. Louis; "The Fire Clays of Missouri," by H. A. Wheeler, St. Louis.

By an error the Litchfield Foundry & Machine Co., of Litchfield, Ill., was referred to in our issue of Sept. 1 as of Litchfield, O. The company manufactures hoisting and stationary engines.

THE ONTARIO IRON RANGES.*

BY A. B. WILLMOTT.

For the past few years there has been considerable examination and discussion of our Ontario iron ores. The geological similarity between certain belts in Ontario and those found south of Lake Superior has been recognized. It has been claimed, especially in the old reports, that Ontario and Quebec abounded in iron ores of the first quality. Our politicians, always desirous of flattering, tell us so today. Yet the Hamilton, Sault and Midland furnaces, notwithstanding much search, have only one large producer on which to draw. In 1902 these furnaces consumed 92,000 tons of Ontario ore and were forced to buy 93,000 abroad. Still, I am inclined to think our politicians will prove right in the long run, and that our lack of ore bodies is due to the fact that we have not sought them in the right way. We have numerous surface indications, the interpretation of which it is the purpose of this paper to discuss.

These ores are found from the Lake of the Woods on the west to the Ottawa river on the east. Just as we have the Menominee, Marquette, Gogebic, Mesabi and Vermilion ranges skirting the American shore of Lake Superior, so we have the Mattawin, Animikie, Nipigon, Michipicoten and Batchawana ranges skirting the Canadian shore. The more important seem to be the Steep Rock-Atikokan, Hunters Island-Matawin, Animikie, Michipicoten, Hutton, Temagami and the Eastern Ontario. These ranges belong with one exception to the oldest geological formations. North of Lake Superior, as south of it, three iron bearing ages are recognized. Oldest is that of the lower Huronian, following this the upper, and third and latest is the Animikie.

The only range found in the Animikie is that extending from Gunflint to Port Arthur and east. The Mesabi, Gogebic and Menominee, together with a part of the Marquette, are its geological equivalents. These latter produce 75 percent of the iron ores of the lake region; we have yet no producing mines in this horizon. These rocks are confined to a small triangular area near Port Arthur, unless the tuffs and shales within the nickel belt of Sudbury prove of this age.

Upper Huronian rocks are more widely distributed. The typical area is that north of Lake Huron to Sudbury and beyond. Wherever Huronian areas are shown on our geological maps future work will probably find both the upper and lower divisions. The upper has not proved prolific in iron. With exception of the larger part of the Marquette range it has no producing mines. About 16 percent of the Lake product for 1900 came from it. Prospects now worked near Deroche and adjoining townships north of the Sault seem to be of this age. So also the mine in Aberdeen township, from which several ship loads of hematite were taken some years ago. Hematite patches in quartzite in Long, Rutherford and other towns, are similar in appearance and of the same age. The ore is of high grade but so far in small quantity.

It should be noted here that the upper Huronian of Canadian writers is equivalent to the lower of American, they having wrongly correlated the Animikie with the original Huronian, whereas it is a later formation.

The lowest and oldest of the three iron bearing formations, the lower Huronian, is much the most widely distributed in Ontario. It has given us our only producing mine of size, and our most encouraging prospects. The Vermilion range is of the same age and a few small worked-out properties of the Marquette. In 1900 less than 9 percent of Lake production was of lower Huronian origin. With the opening of Helen mine this percentage somewhat increased.

It is in these rocks that our main ore supplies will be found. In every area shown on our maps as Huronian, wherever in the Lake region the green schists are found, there also have been, or will be, found the sediments of iron range. These may represent only the last remnants of a large area, or they may be a long and narrow belt. In no case has a band half a mile wide been found. Usually there is a series of lenses arranged in a row, or in parallel rows. In other cases the belts persist for many miles enclosed by green schists. The Hunters island and Mattawin ranges are good examples. The Nipigon-Long lake range is continuous for perhaps 70 miles. The Michipicoten is nearly as long but is frequently interrupted.

At the base of the series of both the Michipicoten and Vermilion, which have been carefully studied and may be taken as characteristic, there is massive greenstone, ellipsoidally parted; the oldest rock known in the Lake Superior area. Overlying this is the iron formation. Later are intrusive granites, porphyries and greenstones. The whole bent in longitudinal folds and closely pressed. Original sediments stand nearly vertical. Massive greenstones have cleavage developed by pressure which corresponds closely to the bedding of the sediments. Metamorphism has so changed the latter that it is difficult to distinguish some of the greenish sediments from the schistose greenstones. Longitudinal and transverse foldings have taken place, and if we could see the bottom of the longitudinal fold we should see a series of hills and valleys. So also the top, but denudation has usually destroyed the surface appearance. In the Michipicoten iron range hills now standing are in many cases the bottoms of the transverse valleys. In such cases it is useless to drill for iron in the green schists between two iron formations looking for ore.

It has been proved that the Lake ores are the result of a concentration by descending waters. The source has in most cases been iron carbonate, the pyrite in the Michipicoten and silicates in the Mesabi have been important factors. Ores seem to have been invariably concentrated in an impervious basin. This in the lower Huronian is the upper layer of greenstone underlying the folded iron formation. Transverse folding has made the trough a basin. This is the case at Josephine and Frances, in Michipicoten and at Chandler-Pioneer in Minnesota and elsewhere. Basins are also made by impervious layers of slate within the formation, and these often defeat their usefulness by making several small basins instead of one large one. Dikes cutting across, particularly where a pitch occurs, frequently form one side of the basin. This is true of the Helen in part; a dike crosses the formation at right angles, dipping 10 degrees in the same direction as the formation pitches. Several dikes of similar character cross the iron formation near Iron lake and one of the best surface showing of the Michipicoten occurs in connection with one of these.

We are led to the following conclusions as to surface indications: An impervious basin of schists or greenstone is favorable; this basin can frequently be seen at the ends of the shorter belts, while the central parts of the longer belts are not likely to give any such evidence. If the basin is in the form of a pitching trough it is still more favorable. On the strength of this drilling was carried on at Josephine and Frances and ores located far below the surface. The crossing of the formation by a dike is favorable, as it may give one side a basin, and at any rate has promoted the water circulation by fracturing the formation. Contact planes are favorable, because here movement has taken place and water circulation promoted. The more broken and crumpled the jasper and chert the better, for the same reason. The less iron in the banded jaspers the better, for it may have concentrated more below. The presence of siderite is unfavorable, showing that concentration is not complete, perhaps not begun. It is true there is a large cliff of siderite adjoining the Helen, but the ore has been made from a body of carbonate that has entirely disappeared. A width of formation is necessary; 100 feet is too little; Helen formation is over 900 ft., Josephine 250 at a depth of 400, and Frances 600 to 900. Impervious layers of slate in the formation are unfavorable as they make a series of basins each too small for concentration. The Michipicoten at Iron lake is an example. Low points in the ranges are more favorable. On the Michipicoten the lowest points on the range have proved best. At Frances is an isolated hill of ferruginous chert 200 ft. above a level plain, and ore

*Read before the Canadian Mining Institute. Mr. Willmott is geologist for the Lake Superior Co. at Sault Ste. Marie, Ont.

has been found 650 ft. below the top. Magnetite is unfavorable, often intrusive granites and igneous rocks occur there. Little concentration took place before the upper Huronian and Keweenawan ages, when these intrusions took place, and apparently none since. On the Mesabi range Keweenawan overflow prevented the formation of merchantable ore bodies on the eastern part of the range. The same condition probably operated about Port Arthur. But because a range is magnetic is not sufficient ground for condemnation, on the contrary, one of our best ranges, the Hutton, is mainly magnetic.

In exploration of any determined area, work should proceed in the following order: Determine the geological boundaries of the formation, especially of the lower Huronian, and cross this at right angles to the strike at intervals of a mile, reduced where there are iron indications, to a quarter mile. Float boulders should be searched for and examined and readings of a dip needle watched, and where iron indications are found complete sections should be secured. An accurate geological and topographic map should be made of the iron range when found. The pitch and depth of a basin can sometimes be approximated by the cleavage of the adjoining schists; the direction of openings in the V-shaped banded jaspers is a guide. Surface stripping should be undertaken while the geological map is in progress. This is enormously cheaper than rockwork. To say nothing of the assistance it gives in determining structure, this work is as liable to find ore as are shallow pits put down at random. It is well established in the Lake region that all ore bodies somewhere reach the rock surface.

If ore is found it should be followed. If not found and indications are for it at depth a choice must be made between shafts and tunnels and diamond drilling. The latter is usually to be preferred because it proves ground cheaper and does the work faster. The prospect shaft will probably be of no use for mining. The valuable knowledge as to size and shape of an ore body can best be determined by drilling. First holes are naturally directed to finding ore, later ones to determining its quantity. Ore is most likely to occur along the sides or bottom of basins and along dikes and other planes of contact. As the schists can be drilled two or three times faster than jasper it usually pays to locate holes in the former, crossing into jasper near the point it is desired to reach. Vertical holes, parallel or nearly so with the bands of jasper, are to be avoided; they are costly and give no accurate record. It is safest to cross these jaspers at a high angle. To reach the bottom of a basin of unknown depth it is best usually to put in several holes from the side at successively higher angles. The depth to which these infolded iron formations go is surprising. At Josephine it is less than 300 ft. wide, but has been proved to be 758 ft. below the lake and may be much deeper. At Frances the formation is 1,450 ft. long and 900 ft. wide, but this short and narrow lense in the schist has been proved to 800 ft. deep, and may be more. In both these cases ore was found by probing the bottom. At Josephine there was no out crop of ore and the banded jaspers were very much impoverished. In Frances a small surface pocket of ore soon gave out. In both theory said test the basin, and in both ore was found.

This is what I meant when I said that our lack of ore bodies was because we did not test for them properly. There has been, in the past two years, some intelligent and systematic exploration of the Steep Rock, Animikie, Michipicoten and Hutton ranges. In most cases this sort of work has resulted in the discovery of ore bodies. But the amount of such work done on all our ranges combined is trifling compared with that in the 25 miles between Tower and Ely, on the Vermillion. The time has gone for running through the woods with a canoe and a pick. We have found our iron ranges in numbers and size, and the question is what is at the bottom of them.

The Beaver Dam Malleable Iron Co., Beaver Dam, Wis., has increased its capital stock from $75,000 to $100,000, and has added to its plant so as to increase the output 25 percent. The entire motive power has been changed to electricity.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Farmers' Co-operative Mfg. Co. was organized at Blue Rapids, Kan., a few days ago with a capital of $50,000, for the manufacturing of farm implements. This will re-establish an implement factory put out of business by last year's flood.

The Central American Agricultural Co., New York, has been incorporated with a capital of $300,000. Directors are: W. Hector Huhn-Hume, Edward J. Maroney and H. C. Vaughn, of New York.

The Cast-Thread Fitting & Foundry Co., Seneca Falls, N. Y., has been incorporated with a capital of $250,000. Directors are: George Breed and Watson Rulton, Philadelphia; Paul R. Clark, Auburn; and James P. Winkle, Seneca Falls.

The Reserve Furnace Co., New Lisbon, O., has been incorporated with a capital of $100,000. Incorporators are: D. G. C. Arnold, N. O. Allen, J. P. Carr, H. A. Van Epps and C. A. Gibbs.

The Magnetic Iron Co., Cincinnati, O., capital stock $25,000, has been incorporated by Alexander Dow, C. H. Davis, C. W. Evans, C. R. Stout and James A. Graft.

Considerable electrical equipment, including several cranes, is to be purchased for installation on the extensive Vera Cruz docks, the contract for the construction of which is in the hands of the British contracting firm of S. Pearson & Son, Ltd., who have a New York office. Upwards of $30,000,000, Mexican currency, is involved in the contract for the construction of the docks.

The Edwards Iron & Steel Co., Rochester, N. Y., has been incorporated with a capital of $250,000. The directors are: H. W. Rippey, T. W. Shannon, Rochester; J. B. Abbott, Genesee.

The Bailey Iron Works Co., Mobile, Ala., has been incorporated with a capital of $50,000. Incorporators are: Arthur Bailey, S. L. Lavengy, W. G. Ward and Caroline Bailey.

The Northwestern Mfg. Co., Milwaukee, Wis., has been incorporated with a capital of $60,000, to manufacture motors, dynamos and other machinery. Incorporators are: William P. Harper, William Stark Smith and John T. Harper.

The U. S. Locomotive and Equipment Co., Bridgeport, Conn., has been incorporated with a capital of $100,000, to construct locomotives, cars and other equipment or means of transportation, and carry on the business of contractors for the construction of railways, gas, electric light and power properties.

Initial steps have been taken for the establishment of a large shipbuilding plant at Portland, Ore. For this purpose the Portland Steel Shipbuilding Co. has been incorporated, beginning with a capital of $25,000. It is understood that this capital will be largely increased. Incorporators are: Albert Kelly, Alexander Hyde, William Rodgers and George Rodgers. All of these gentlemen are practical shipbuilders, having been engaged in that business in England, Ireland and Scotland. The charter is a broad one, giving ample opportunity for expansion. A site has been purchased and arrangements are being made for the building of the plant.

New Construction:—

The Singer Mfg. Co., Elizabethport, N. J., is erecting a large plant at St. Johns, Que., for the exclusive manufacture of sewing machines.

The Reading Iron Co., Reading, Pa., expects to have its new threading department completed by Nov. 1. This will practically complete the rebuilding of the company's plant, which is now one of the best in the country. The machinery in the threading department will be run by electric motors. Further improvements are to be made at the mills on the north side of South street.

The Wright Wire Co., Worcester, Mass., is increasing the capacity of its works at Palmer about 1,000 tons of

finished fine wire a year by the installation of additional machinery and the erection of new buildings.

The Seamless Steel Tubes Co., of Detroit, Mich., has recently been reorganized and renamed, and will in future be known as the Detroit Seamless Steel Tubes Co. This company makes a specialty of cold drawn seamless steel locomotive flues, and stationary boiler tubes. Plans are now being prepared for large additions to the plant to meet the increasing demand for the product.

The Koepke Nut & Bolt Co., Elyria, O., is building an addition, 50 x 73 ft., which it is expected will be completed in October.

The Simplex Mfg. Co., Montreal, has decided to erect a new plant for the manufacture of steel axles and car supplies. The company has heretofore operated in leased premises. A site of 40 acres has been purchased.

The United States Steel Corporation is preparing to erect a warehouse at Louisville, Ky., to store products which are to be distributed through the South. The building will be 100 x 200 ft.

A. A. Koch, who recently bought the Hathorn foundry at Mason City, Ia., changing the name to the Vulcan Works, has commenced to remove the old buildings and will replace them with modern structures. Adjoining the office will be a machine and blacksmith shop, 40 x 100 ft. The foundry will be 40 x 60 ft. and the pattern and wood-working shop, 32 x 40 ft. Mr. Koch expects to have the buildings completed within 90 days.

The American Steel Package Co., Defiance, O., has let the contract for the construction of a new building 36 x 200 ft., which will be completed and ready for occupany within 60 days.

The directors of the Simplex Washing Machine Co., Davenport, Ia., whose plant was recently destroyed by fire, has decided to rebuild. Considerable new machinery will be purchased.

It is now announced that the Binghamton Car Works of the American Car & Foundry Co., near Memphis, Tenn., will be opened Sept. 15. Important additions will be made to the machinery of the plant. It is expected that the capacity of the plant will be increased from eight to sixteen cars per day. The plant will start with an order from the New Orleans & Northeastern railroad for 350 cars and will also have a large number of repair orders.

The Buffalo, Rochester & Pittsburg railroad has announced that a new boiler shop, 300 x 140 ft. will be built at Du Bois, Pa., at once. When this addition is completed the Du Bois shops will have a capacity for turning out an engine every 36 hours.

Contractors are beginning to figure on tearing down the Rio Grande machine shops and round-house at Pueblo, Colo., preparatory to constructing new buildings. There are 23 buildings to be removed from Pueblo yards before the work can begin on the new shops, which will be used jointly by the Denver & Rio Grande and Missouri Pacific roads. A new round-house will be built to accommodate from 40 to 60 engines.

The Sykes Steel Roofing Co., Chicago, will erect a new building 120 x 110 feet, four stories, at a cost of about $40,000.

Fires and Accidents:—

A fire which resulted in damage to the amount of about $8,000 visited the plant of the Stockton Iron Works, Stockton, Cal., Aug. 26. The loss is partially covered by insurance.

The Superior Machine Co.'s plant, Bowling Green, O., was completely destroyed by fire Aug. 28. Loss, $7,000; insurance, $5,000.

An explosion of gas in an iron furnace of the Lafollette Coal & Iron Co., Lafollette, Tenn., Aug. 28, resulted in the death of two men and the serious injury of one other.

Fire in the plant of the Greenslade Foundry Co., Milwaukee, Sept. 2, caused a loss of $4,000, fully covered by insurance.

The cement plant of the Struthers Cement Co., Struthers, O., near the Struthers Furnace Co.'s plant, was destroyed by fire Sept. 2. Loss, $120,000; insurance, $80,000. The plant will be rebuilt at once with fire proof structures.

The plant of the United States Cast Iron Pipe & Foundry Co., at West Superior, Wis., was damaged by fire to the extent of $75,000 Aug. 31.

General Industrial Notes:—

The Kelley Mfg. Co., engaged in the manufacture of steel grip shoestrings, has removed its plant from West Eighth and Cherry streets, Des Moines, Ia., to West Eighth and Grand avenue, of that city. The change in location was made to afford more room for the rapidly increasing business of the company.

Five hundred employes of the Pullman Co., Pullman, Ill., were paid Aug. 30 and told there would be no more work for them until further notice. This left the shops with only 1,500 men and gave color to the report that the great plant will be closed.

The wire mill department of the American Steel & Wire Co. plant at Waukegan, Ill., has resumed with a full force of men. This department has long been partly but never completely shut down on account of slack business. Now, however, orders are increasing.

The British iron and steel firm of Bolckow, Vaughan & Co. has secured the contract for 8,000 tons of rails for the West Australian railways, on which American mills made bids. The accepted bid was £4 12s 6d delivered. The rails are to be 60-65-lb. weight.

The rolling mill plant of the National Enameling & Stamping Co., Granite City, Ill., was started with a full force in each department on Sept. 6. The management states that it has orders ahead to fill out the remainder of the year. All labor difficulties have been satisfactorily adjusted and the scale of the Amalgamated Association has been signed.

The Oregon Plating & Machine Works, recently incorporated at Oregon, Ill., have elected the following officers: President, W. E. Cleveland; vice president and superintendent, J. O. Petty; secretary and treasurer, Charles M. Gale; directors, John Purves and C. D. Etnyre. The company is occupying a flouring mill which has been remodeled to suit the purposes of the purchaser.

One of the largest single orders for railroad equipment for export ever placed with American manufacturers has just been closed. It is for 640 freight cars for the Argentine Republic railways. An order for 38 passenger, sleeping and baggage cars for these railways has also been closed. The freight cars will be furnished by the Middletown (Pa.) Car Works and the passenger cars by the Wason Mfg. Co. The American manufacturers secured the orders in face of strong competition on the part of British, German and Belgian manufacturers. It is understood that inquiries are in the market for a considerable number of locomotives, also for rails and other equipment. During the past two months there has been a decided increase in shipments of railroad materials to the Argentine Republic.

The Chicago Steel Mfg. Co., whose plant was destroyed by fire about a year ago at Hammond, Ind., has completed a new plant at New Castle, Ind., and commenced operations last week under auspicious circumstances.

A large shipment of safe steel for safe makers in England was made last week by the Norwalk Steel & Iron Co., Norwalk, O. Three firms of safe makers in England have recently ordered this steel.

The Portsmouth Steel Co., Portsmouth, O., closed its plant Sept. 1 indefinitely. About 500 men are thrown out of employment.

The molding machine foundry of the International Steam Pump Co., Harrison, N. J., started Sept. 1 with about 75 employes. This is the first part of the plant to begin operations. The others will follow as soon as the construction can be finished and the machinery installed.

Sterling H. Campbell, of Chicago, inventor of a new process of manufacturing steel boats, has made a proposition for the establishment of a plant in Muskegon, Mich., to the Chamber of Commerce of that city. Articles of incorporation have been drawn up ready to be filed. The company will have a capital stock of $30,000.

The Friedrichstadt shipyards (of J. & A. Jensen ag Dahl, Kristiania), one of the largest in Norway, have

adopted the Haeseler pneumatic hammers and drills as standard, and have placed a two-year contract with the Ingersoll-Sergeant Drill Co. covering their requirements.

The Ingle Machine Co., Rochester, N. Y., has purchased and succeeded to the business of the C. J. Palmer Co., of that city, manufacturing special machinery, also doing contract machine work and general repairing. The plant is located at the corner of Mill and Furnace streets, and covers an area of 10,000 square feet. The machine tool equipment of the shop is complete and of the latest design.

The Oil & Waste Saving Machine Co., Rochester, N. Y., recently incorporated, was formed for the purpose of manufacturing machinery for separating and reclaiming oil in waste and other similar substances. The company has its machinery built under contract in Rochester, and will continue to do so for several years at least. The company states that one pound of waste used in an engine room will on an average absorb three pounds of oil before being discarded. The company's machines save both oil and waste, so that both can be used over and over again.

Wilmarth & Morman Co., Grand Rapids, Mich., has in the past month made shipments of drill grinders to the following countries: One to Scotland, five to Australia, one to Japan, three to Holland, one to Switzerland, four to England, one to Cuba, four to Russia, as well as a number to machine tool jobbers in the various countries. Shipments to American firms include the following: Three Rivers R. R. Supply Co., Three Rivers, Mich.; J. G. Glessner, Littleton, N. J.; Dean Electric Co., Elyria, O.; Plymouth Cordage Co., Plymouth, Mass.; Coffin Valve Co., Boston, Mass.; Nashua Mfg. Co., Nashua, N. H.; American Ry. Co., of Porto Rico, San Juan, P. R.; Standard Horse Nail Co., New Brighton, Pa.; A., T. & S. F. R. R. shops, Richmond, Cal.; General Railway Signal Co., Buffalo, N. Y.; and to the United States mint at Denver, Co., one large direct connected motor driven wet drill grinder of the style "P. M.'

The Kempsmith Mfg. Co., Milwaukee, Wis., manufacturer of milling machines, states that while business in its line has been slack in the past summer, it has materially improved in the last two weeks. A number of repairs, improvements and enlargements have been made to the company's plant, increasing its efficiency and output.

Oregon Foundry & Machine Co., Oregon, Ill., manufacturer of molding machines, etc., advises us that its business all year has been very prosperous. Several good sized orders for molding machines have been booked recently, and the company is now engaged in equipping two large foundries with machines of this character, and two other plants with soil pipe machines and core outfit complete. It reports that it has closed several contracts for castings on a sliding basis.

The Howard Axle Works, of the Carnegie Steel Co., Homestead, Pa., resumed operations this week after an extended idleness. With the resumption of this plant practically all of the idle departments of the Homestead plant are in operation. At the Edgar Thomson works both the old and new rail mills are in operation, while nine of the eleven furnaces are in blast, the tenth to resume shortly.

On Thursday, Sept. 1, the billet mill at the Clairton plant of the Carnegie Steel Co., Clairton, Pa., rolled 107 tons of 4 x 4 billets in one hour. This is said to be a record run on billets of this size.

The A. Garrison Foundry Co., Pittsburg, has received an order from the Pittsburg Reduction Co. for the erection of three 28-inch plate mills which are to be installed at New Kensington, Pa. The mills are to be used in the rolling of aluminum sheets.

The new plant of the Graham Nut Co., on Neville island below Pittsburg, was placed in operation last week. The main building is 90 x 240 feet. As soon as this plant is operating in full the Allegheny works will be abandoned. Track connections with all the Pittsburg main lines are afforded by a switch connection with the Pittsburg & Lake Erie railroad.

The American Furnace & Machine Co., Pittsburg, last week brought suit against Joseph A. Null, president and treasurer of the company, to recover $15,000 which it is alleged was secured from the company illegally. It is alleged that the statement made to the other directors of the company was found to have been incorrect and that they decided not to purchase his stock. It is claimed that after he was served with this notice Null drew a check payable to himself calling for the amount asked for in payment for his one-third interest in the firm.

The second battery of 53 by-product coke ovens at the Sharon, Pa., plant of the Carnegie Steel Co. was fired last week. Half of the plant, consisting of 106 ovens, is now in operation, and the remaining two batteries will be fired shortly. The entire plant has an output of 1,000 tons daily. The coke has been shipped to the company's furnaces at Youngstown in the past, but owing to the increase in the output shortly, the coke will also be used at Sharon.

The Battle Creek Iron Works Co., Ltd., of Battle Creek, Mich., has had its plant closed down for the past four months pending a settlement with creditors. This has now been concluded and a reincorporation has taken place under Michigan laws, the stock being reduced from $600,000 to $100,000. The company is ready to put its $100,000 foundry and machine shop plant and $10,000 cash into a consolidation with some concern that will remove to Battle Creek.

Great Tonnage Record on the Bessemer Road.

In the month of August all previous records for the movement of ore from lower lake ports were broken by the Bessemer & Lake Erie railroad. In this month 646,063 tons of ore were hauled from the Carnegie docks at Conneaut, O., as against 627,000 tons during the month of July. To move this enormous tonnage 354 solid trains were required, averaging 1,776 tons for each train load. Despite the shortness of the present navigation season, all indications point to a greater season's movement of ore than ever over this road. Careful computation places the figures at 4,221,000 tons, as compared with 4,186,000 tons, the best previous record, made in 1902. Last year the total carried was 3,917,000 tons. This road is the most profitable railroad property owned by the United States Steel Corporation, and for its length is probably the most valuable piece of railroad property in the world.

The Harder Gas Furnace Co., Birmingham, Ala., recently incorporated, was formed for the purpose of introducing and installing the Harter system of burning producer gas under boilers. The company has not yet decided when or where it will build its shops. It will proceed immediately to take contracts for the installation of its system in all kinds of power plants. The company proposes to furnish plans, specifications, etc., to all interested parties. It will purchase gas producers from manufacturers who are already in that line, and let contracts for all structural iron work, gas mains, coal and ash-handling machinery, pipe and brick work. The inventor and his associates have constructed a furnace under a battery of boilers at the Birmingham Rolling Mills Co.'s plant for burning producer gas and have been making experiments and tests for the last seven months. The furnace is so constructed that the gas and air are heated to a high temperature before they meet in the combustion chamber. It is claimed that the furnace affords an absolutely smokeless combustion.

The September number of *Graphite*, the creditable and always interesting publication of the Joseph Dixon Crucible Co., has some special matter on the preservation of metal surfaces with Dixon's silica-graphite paint. A number of excellent half-tone illustrations appear of notable steel structures, and the elements of good paint and good painting are discussed in an informing way.

A charter has been granted to the Driggs-Seabury Ordnance Co., of Sharon, Pa., with $50,000 capital. Contracts for the erection of the plant have already been awarded. The directors are John Stevenson Jr., Thomas A. Harris, A. T. Cole, C. T. Lark, L. R. Grant, W. J. Bagnall, and Alexander Meogh.

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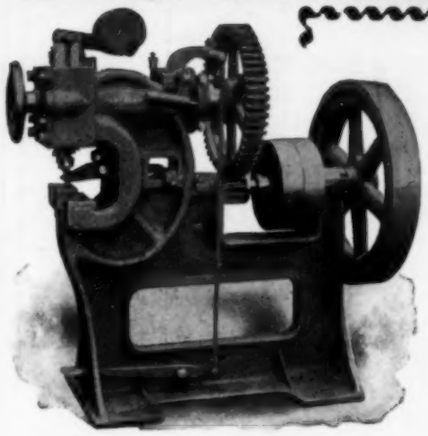

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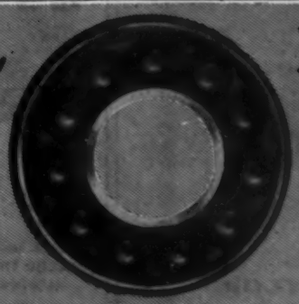

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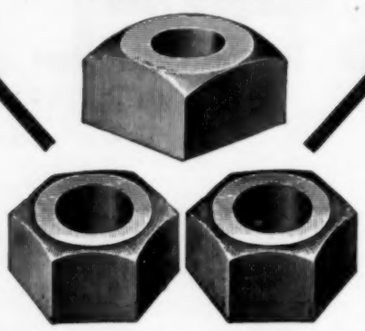
Cuyahoga Falls, O., U. S. A.

"MILTON"



NUTS

HOT PRESSED *or* COLD PUNCHED

Are made of double refined bar iron. They're true to size, and well finished. This ought to interest you, but if not—the price certainly will.

CATALOG?

THE MILTON MANUFACTURING CO., Milton, Pa.